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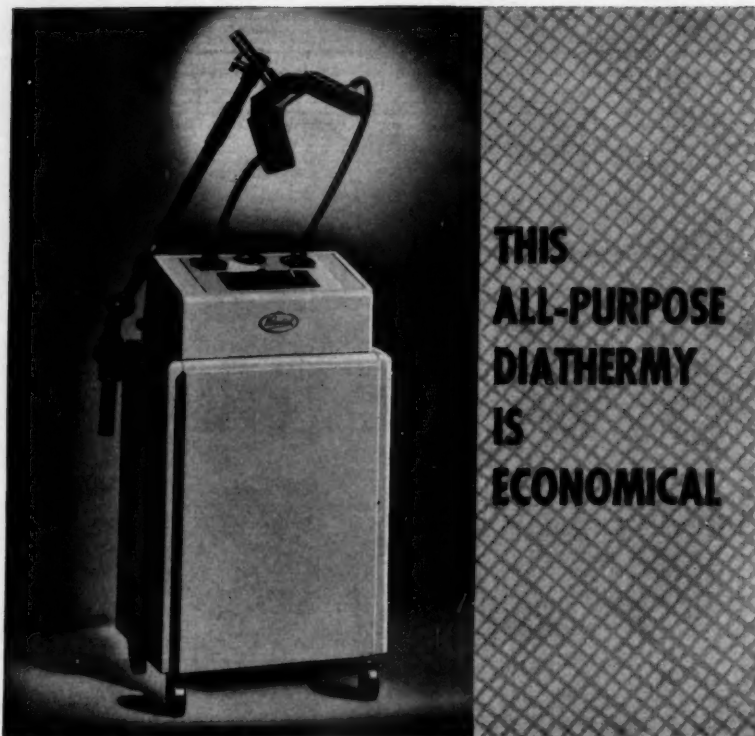
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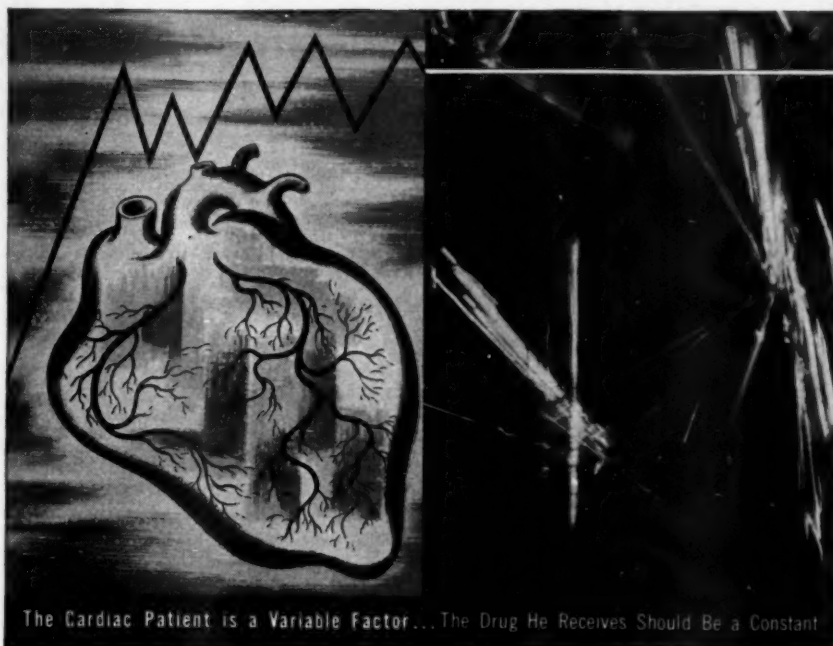
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1. Gardner, L. L.; MacLachlan, E. A.; Pick, W.; Terry, M. L., and Butler, A. M.: *Pediatrics* 5:228, 1950.

2. Nesbit, H. T.: *Texas State J. M.* 38:551, 1943.

3. May, C. D., et al.: *Bull. Univ. Minnesota Hospitals* 21:208, 1950.

4. Recommended Daily Dietary Allowances, Rev. 1948, Food & Nutrition Board, National Research Council.

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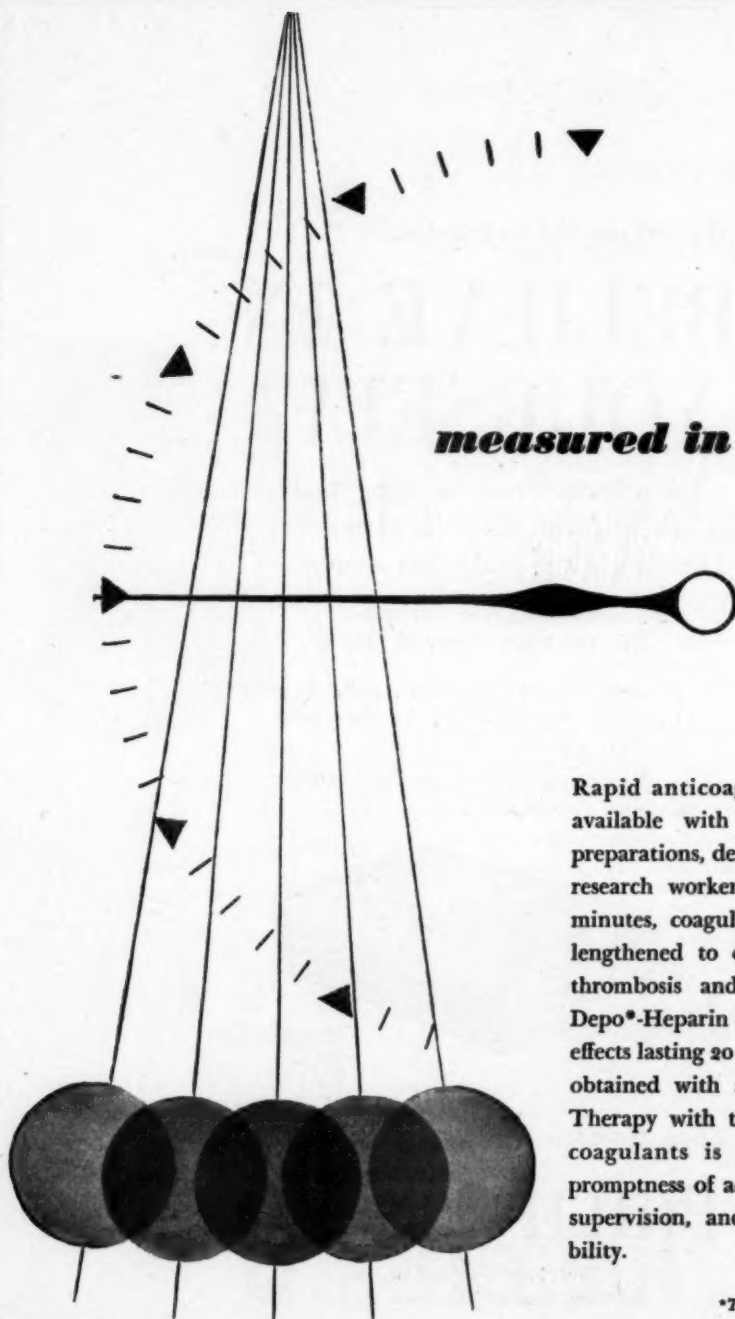
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References:

1. Burke, B. S. and Stuart, H. C.: J.A.M.A., 137:119, 1948.
2. Burke, B. S. et al.: Am. J. Obst. & Gynec., 46:58, 1943.
3. Burke, B. S. et al.: J. Nutrition, 26:569, 1943.
4. Javert, C. T. and Finn, W. E.: Texas State J. Med., 46:745, 1950.
5. McLester, J. S.: Nutrition and Diet in Health and Disease, Saunders, Phila., 4th ed., 1944.
6. National Research Council: "Recommended Food and Nutrition Board, Daily Allowances for Specific Nutrients," Wash., D. C., 1948.
7. People's League of Health: J. Lancet, 2:10, 1942.

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REFERENCES: Spielman, A. D. (1950), N. Y. St. J. Med., 50:2297, Oct. 1. Brown, E. A., et al. (1950), Ann. Allergy, 8:32, Jan.-Feb. Jenkins, C. M. (1950), J. Nat. Med. Assn., 42:293, Sept. Cullick, Louise, and Ogden, H. D. (1950), South. Med. J., 43:632, July. Ehrlich, N. J., and Kaplan, M. A. (1950), Ann. Allergy, 8:682, Sept.-Oct.



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1. Schoenbach, E. B.; Bryer, M. S., and Long, P. H.: Ann. New York Acad. Sc. 53:245 (Sept. 15) 1950.
2. Herrell, W. E.; Heilman, F. R., and Wellman, W. E.: Ann. New York Acad. Sc. 53:448 (Sept. 15) 1950.
3. Welch, H.: Ann. New York Acad. Sc. 53:253 (Sept. 15) 1950.
4. Hubbard, W. N., Jr., and Tillet, W. S.: Ann. New York Acad. Sc. 53:429 (Sept. 15) 1950.
5. Timpanelli, A.; Huebner, R. D., and McDermott, W.: Ann. New York Acad. Sc. 53:440 (Sept. 15) 1950.
6. King, E. Q.; Lewis, C. N.; Welch, H.; Clark, E. A., Jr.; Johnson, J. B.; Lyons, J. B.; Scott, R. B., and Cornely, P. B.: J.A.M.A. 149:1 (May 6) 1950.
7. Finland, M.; Gecke, T. M.; Jackson, C. G.; Womack, C. R., and Kass, E. H.: Ann. New York Acad. Sc. 53:290 (Sept. 15) 1950.
8. Baser, R. E.; Parker, R. T.; Hall, H. E.; Benson, J. F.; Joslin, B. S.; Hightower, J. A.; Snyder, M. J.; Venable, S. J., and Woodward, T. E.: Ann. New York Acad. Sc. 53:395 (Sept. 15) 1950.
9. Blake, F. G.; Frison, G. J., and Wagner, R. R.: Yale J. Biol. and Med. 25:495 (July) 1950.
10. Knight, V.: New York State J. Med. 50:2173 (Sept. 15) 1950.
11. Herrell, W. E.; Heilman, F. R.; Wellman, W. E., and Bartholomew, L. A.: Proc. Staff Meet. Mayo Clin. 25:183 (Apr. 12) 1950.
12. Keeler, C. S.: Ann. New York Acad. Sc. 53:223 (Sept. 15) 1950.

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*Towse, R. C., Berberian, D. A., and Dennis, E. W.: *New York State Jour. Med.*, 50:2035, Sept., 1950.

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ORIGINAL ARTICLES

DELAYS IN THE DIAGNOSIS OF TUBERCULOSIS FROM THE INCAUTIOUS USE OF ANTIBIOTICS

W. H. OATWAY, JR., M.D.*

Several years ago the versatile Dr. Walter Alvarez wrote a paper in which he drove home his major point by a series of brief one-paragraph case-reports. Each led to the same obvious conclusion, and the weight of the evidence was great and unforgettable.

It is proposed that the same thing be done in the present report. A discussion and summary will follow, but the evidence is so overwhelming that it will be presented first.

It was recently noted that case-histories of newly admitted patients to a southern California sanatorium included mention of the use of penicillin and other drugs for supposedly non-tuberculous conditions. This often happened without any attempt to exclude or make a diagnosis of tuberculosis.

It was decided to re-check all such information for greater accuracy by questioning the patients. The results were amazing.

Twenty cases is a small number, but the emphasis derives from the fact that the sanatorium contains only fifty beds. *Forty per cent of the patients in residence on February 15, 1951, had suffered to some degree from the 'blind' use of chemotherapy.*—

A—CHEMOTHERAPY WITHOUT AN EXTMINATION FOR TUBERCULOSIS,—

1. A woman, age 25. Two young children in family. 'Cold' with pleurisy for two months, treated with sulfadiazine and *penicillin*. Hemoptysis caused patient to insist on an x-ray. FA exudative lesion found, with cavitation. (Duration of delay . . . 2 months).

2. A woman, age 26. One young child in family. 'Bad cold' treated with *penicillin* and *aureomycon* for 2 months. Diagnosis by *survey* film. FA exudative lesion with cavity. (Duration of delay . . . 2 months).

3. A woman, age 26. Two young children in family. 'Bronchial trouble' with asthma for 2 years, 'pleurisy' for 1 year. *Penicillin* inhalations at intervals, and for a recent 'cold'. Diagnosis finally made by a thorough clinician with gastric culture and G.P. X-ray shows a subminimal lesion. (During of delay . . . 1 to 2 years).

4. A woman, age 29. 'Virus infection' treated with *penicillin* for 2 weeks. Diagnosis made by chance *survey* film) of moderately advanced exudative disease with cavity. (Duration of delay . . . 2 weeks).

5. A man, age 22. 'Pneumonia' with asthma, diagnosed without x-ray 2 years ago, treated with *penicillin*. Diagnosis by *survey* film showed scattered exudative patches with numerous small cavities. (During of delay . . . possibly 2 years).

6. A woman, age 69. Contact with several grandchildren. 'Virus pneumonia' diagnosed 6 months ago but without x-ray. *Penicillin* given until patient got up to care for a sick relative. Diagnosis by *survey* film 3 months later; moderately advanced lesion. (Duration of delay . . . 6 months).

7. A woman, age 38. 'Bad cold' treated with *penicillin* for weeks. Skin-tests had once been negative, so x-ray was not made until a *survey* film was taken, 3 months and 2 doctors later. Lesion moderately advanced.

*La Vina Sanatorium, Altadena, California. (This report was given the Annual Trudeau Award of the California's Trudeau Society, April, 1951, and the contest prize of \$150.)

(Duration of delay . . . 6 weeks).

8. A woman, age 36. 'Colds' for 3 months, 'pleurisy' for one week. Therapy with *chloromycetin* for one week. *Survey* film taken by chance showed FA disease with cavity. (Duration of delay . . . 1 to 3 months).

B. CHEMOTHERAPY, WITH THE TUBERCULOUS LESION MISINTERPRETED,—

1. A male, age 46. 'Bad cold' 18 months ago, treated with *penicillin* injections and inhalations for 2 weeks. X-ray showed patchy lesions, but no further study was made. *Survey* film showed slight increase in MA tuberculous disease. (Duration of delay . . . 18 months).

2. A woman, age 45. After an accident to her chest 2 years ago, an effusion from trauma was noted, plus a patchy lung lesion. No other diagnosis made. 'Virus pneumonia' the following winter was treated with *streptomycin* because of the patient's sensitivity to *penicillin*. Several courses were given for bronchial symptoms during the next year before a persistent high fever forced a diagnosis of FA tuberculosis with atelectasis and cavity. (Duration of delay . . . 2 years).

3. A woman, age 54. 'Lobar pneumonia' 6 years ago. No x-ray taken, but 'sulfa' was given. 'Virus X', bronchitis occurred 3 years ago, and recurred each winter since. Fluoroscopy was occasionally done. *Penicillin* and (recently) *aureomycin* were used for therapy. The patient continued to work as a nurse. Recent x-rays fell into the hands of a specialist. FA disease was diagnosed with a large cavity and evidence of several bronchogenic spreads. (Duration of delay . . . 3 to 6 years).

4. A woman, age 39. 'Virus infection' 5 months ago, treated with a 'sulfa drug', later with *penicillin*, and finally with *terramycin*. *Survey* film read as negative. Pleural effusion developed, with tubercle bacilli found by culture and G. P. Earlier films reviewed and seen to contain minimal lesion. (Duration of delay . . . 4 to 5 months).

C. CHEMOTHERAPY IN KNOWN BUT FORGOTTEN CASES OF TUBERCULOSIS,—

1. A woman, age 27. Tuberculosis known to be present for 8 years, but was called inactive. 'Flu' one month ago. *Penicillin*, *aureomycin*, and *terramycin* were tried in order. The occurrence of a pleural effusion resulted in the diagnosis of tuberculous ac-

tivity. (During of delay . . . 1 months).

2. A man, age 36. Tuberculosis known and treated for 4 years, considered to be arrested. Work and emotional strain were followed by 'intestinal flu'. *Terramycin* used for treatment. An hemoptysis resulted in a diagnosis of exudative and cavitative disease. Duration of delay . . . 6 weeks).

3. A man, age 44. Tuberculosis known and casually treated at times for 10 years. Three children in contact. A 'cold' and several 'sore throats' 6 months ago. *Penicillin* therapy was used, but finally stopped because of reactions. An active FA tuberculosis was diagnosed by x-ray later in the year. (Duration of delay . . . 6 months).

4. A woman, age 42. Tuberculosis known to be present for 10 years. 'Virus flu' was diagnosed a year ago, was treated with *aureomycin*. 'Virus flu' 1 month ago, treated with *aureomycin*, was followed by hemoptysis, followed by diagnosis of active FA tuberculosis. (Duration of delay . . . 1 year).

5. A man, age 38. Tuberculosis known and treated 15 years ago. Limited service in the Army Medical Corps. X-rays for 3 life insurance exams read as negative 4 months ago. A 'cold' with bronchitis 2 months ago was followed by bronchitis a month ago. *Penicillin* used for a week, then *aureomycin*. Fever and chill were followed by an x-ray which showed bilateral FA exudative tuberculosis with new cavitation. (Duration of delay . . . 2 to 4 months).

6. A man, age 46. Four children in the family. Tuberculosis first known 6 years ago, when a 'strep throat' was treated with *sulfadiazine* for 4 weeks, relapsed and the lung disease was recognized, treated and arrested. One year ago, after hard work, he felt asthenic and had bronchitis. Rest and some sort of *antibiotic* pills were used. MA tuberculosis was diagnosed when condition did not improve. (Duration of delay . . . 2 to 12 months).

7. A man, age 45. Tuberculosis was diagnosed 10 years ago, treated by San. care and observed since by x-ray. For past year *sulfadiazine* and *penicillin* were repeatedly used for 'bronchiectasis; but no sputum examination was done. More ill 3 months ago, and finally sent to San. with FA fibro-cavernous disease. (Duration of delay . . . 1 year).

8. A woman, age 52. Tuberculosis was

known 14 years ago, treated actively for the first 4 years. A 'virus' Infection two months ago was accompanied by fever, chills, etc. Therapy was *penicillin chloromycetin*, and *aureomycin* was used for 6 weeks, but no x-ray was taken. She returned to work as a nurse, in the nursery of a hospital, but still felt ill. An x-ray finally showed FA disease with a 10 cm. cavity. (Duration of delay . . . 2 months).

DISCUSSION

There are numerous items of interest in this series of cases, and several deductions which can be made.

A free use of antibiotic drugs in cases with respiratory symptoms is bound to include some persons with pulmonary tuberculosis. If an x-ray method is not used, or bacterial studies are not made, these cases will be undiagnosed. Unrecognized cases may progress to a more serious status, and will remain a hazard in contact with family members or other associates.

These things have happened in the cases which have been outlined. They were all infectious at the time of admission to the sanatorium and some of them had become almost untreatable because of the delay and false security given by the use of the antibiotics.

Doctors and patients are alike responsible for the failure to exclude tuberculosis. The patient wants quick and modern treatment; he wants no expensive x-rays; he would cringe away from the idea of tuberculosis if such a thought ever touched his mind. The patient who has had tuberculosis may be just as human, but he is more guilty if he does not insist on a checkup of his lungs when he has an illness with respiratory symptoms. It is his disease and he is partly responsible for it. Too many are ignorant about their own condition, blindly hopeful, and willing to take a chance.

The physician has the duty to be clinically alert for tuberculosis, to use whatever diagnostic measures are needed to exclude it, and to limit chemotherapy to illnesses for which the drugs are useful. He must not overstep the limits of his own type of practice, and should obtain the help of a chest specialist whenever needed. He has no right to prescribe estrogens, 'cold shots', adrenal corticoid substances, iron, vitamin injections (all of which were used in the cases in this series) without an assurance of their need or the absence of tuberculosis. He can take

advantage of free or low-cost x-ray service when the patient is not able to pay for more. He might consider the growing belief that an internist or general practitioner can not practice good medicine without the aid of a fluoroscope.

The chest specialist and sanatorium physician are duty bound to instruct the patient in his future conduct, in the implications of his disease, and in the need for eternal caution, care, and checkups.

The drugs themselves are too alluring, and the reports about them somewhat delusive. Ten years ago a few thoughtful physicians speculated that the sulfonamides might obscure or delay diagnosis of tuberculosis if they were used too casually. The advent of penicillin confirmed that possibility, and patients with neoplasms or tuberculosis came to light at long last when the drugs had 'failed'.

Now we have aureomycin, chloromycetin, terramycin and a probable host of others yet untried. The newer ones become less toxic; the cost is bound to decrease; their use is simplified by oral administration; and they are freely available.

The 'spectrum of activity' is so broad that one is led to believe that pneumonia may be blindly treated, with examination only in case of therapeutic failures. The newer antibiotics are highly effective in coccal and other bacterial pneumonias, in viral, rickettsial, actinomycotic, and other non-bacterial lung infections. Such statements in medical literature or advertising as ". . . the drug of choice in pneumonia, regardless of etiology", and "Once clinical or radiographic diagnosis of pneumonia is made, it is advantageous to start treatment at once, and lose no time waiting for reports of bacteriologic studies", and ". . . there were no cases in which it failed," give too much encouragement. One tends to think of these sentences out of context, and to remove the diagnostic brakes.

A 'broad spectrum' is very fine, but x-ray and bacterial studies are even better.

The 'Duration of Delay' in the cases listed here is only a rough estimate. It might be less in certain cases; it undoubtedly would have been longer in others but for the coincidence of a huge chest x-ray survey which was under way in this area during eight months of the past year. It was a saving factor in several of the cases, as noted; it was a factor in 46 per cent of all cases now in the sanatorium. One shud-

ders when thinking of their fate without the present diagnosis. One hopes for constant and inexpensive x-ray stations for case-finding.

The twenty cases which are reported were fortunate enough to be diagnosed, and are in a small sanatorium. There must be hundreds of similar others in the sanatorium system of the county. There must be thousands in the general public right now whose tuberculous condition is being obscured by non-specific antibiotic therapy. These, and the persons to whom it could happen in the future, are the ones which greater care can protect.

CONCLUSIONS

1. Chemotherapy for lung infections may be hazardous if tuberculosis is not ruled out as a cause of the symptoms.

2. Twenty patients in a small sanatorium of fifty beds have had an appreciable delay in the

diagnosis of tuberculous activity because of the use of chemotherapy and the lack of x-rays, bacterial studies, and clear thinking.

3. The newer antibiotics give a false sense of security because of their broad field of action. The drugs are efficient and attractive, but they must be aimed more precisely at specific and vulnerable infections.

4. The physician and patient both seem to be responsible for the delay in diagnosis, and for a variety of reasons.

5. Persons who have had tuberculosis are especially at fault if they do not check on the cause of lung symptoms.

6. A chest x-ray survey has been especially valuable in helping some of the present patients to a diagnosis. It would be valuable to have inexpensive case-finding facilities constantly available, and physicians would be wise to use them more freely.

THE TREATMENT OF COMMON URINARY TRACT INFECTIONS

ROBERT H. CUMMINGS, M.D.

It has been just 77 years since the specific relationship between microorganisms and infectious disease was first demonstrated in the case of anthrax by Robert Koch. Within the next ten years most of the specific bacteria with which we are familiar today were identified and their specificity demonstrated, according to the postulates laid down by Koch. From that time too, stem the discoveries and the enunciation of the principles and procedures upon which recognition, control, and treatment of all infectious disease is dependent. It is inconceivable that the trained internist today would diagnose typhoid fever without blood culture of Widal reaction, syphilis without serological investigation, subacute bacterial endocarditis without a blood culture, malaria without blood smears, amoebiasis without stool examination and the others too commonplace to mention. Yet, in acute and chronic infections of the urinary tract, diagnosis are made in most cases without, at best, more than an inadequate urine examination.

This is an incongruous situation when one stops to recall the lengths to which one goes to establish the presence of tubercle bacillus in the sputum of the suspected tuberculous patient or positive agglutinations in brucellosis. In every case of urinary tract infection the etiology

may be determined with relatively simple procedures on the urine. In these infections we possess the most ideal opportunity in medical practice to apply specific therapy to accurately identified microorganisms.

In the past ten years we have been privileged to witness the development of chemotherapy and antibiotic therapy, and to enjoy their application. There are evolving, through constant search, forms of therapy specific for even some of the most resistant microorganisms. Yet, in this period of specific therapy, it has been said that pitfalls await the therapist. Seneca, Henderson, and Harvey, in the June 1949 *Journal of Urology* say, "The use of chemotherapeutic agents of any description implies a great clinical responsibility since inadequate or erratic dosage or illadvised choice of any agent is liable to give rise, through natural selection, to daughter strains much more resistant to treatment than the original infecting organism. Hence, a poor therapeutic effort is more than unsuccessful; it is intrinsically harmful."

It is with these two weaknesses in mind, the failure to identify the causative microorganisms and to apply considered specific therapy, that I have prepared these remarks concerning the treatment of common urinary infections. I shall not include tuberculosis, but shall consider com-

mon urinary infections as those pyogenic inflammatory processes of the kidney, ureter, are bladder, manifest by pyuria and bacteriuria.

The symptoms of genito-urinary infection are well known to all and easily recognized. In a like manner, the signs on physical examination need no elucidation. The examination of the urine is of major importance in the management of the patient. The specimen from the female is secured by catheterization in all cases, for by no other means may an uncontaminated specimen be secured. This implies implicitly that a voided urine in the female is valueless. In the male, however, catheterization is unnecessary. Soap and water preparation of the phallus followed by the collection of a portion of the second glass of urine assures an uncontaminated specimen of bladder and kidney urine. The specimen thus secured is studied in the routine manner. The sediment is examined on a wet spread for casts and the number of erythrocytes and leucocytes counted and noted. The wet spread is then air dried, care being taken to avoid heat, because of the real possibility of blasting microorganisms by excessive temperature. After fixing the dried smear by gentle flaming, it is stained by the gram method or for practical ease, by the use of methylene blue. The recognition of microorganisms in every infection is possible and their identification as cocci, bacilli, or both is made. At this point, the definitive treatment of the infection may be initiated but there are three more factors that should be ascertained: 1. The presence or absence of calculi; 2. The presence or absence of an obstructive uropathy of the kidney or bladder outlet; 3. An estimation of the renal function. In the presence of a calculus, it is impossible to eradicate an infection. The same is generally true in obstruction, and in regard to renal function, certain therapeutic substances are contraindicated when impairment is demonstrated.

It is estimated that between 70 per cent to 90 per cent of urinary pathogens are gram negative bacilli; the remainder are gram positive cocci. In reality, both may exist in any one infection and Chittenden of Detroit found 75 per cent of his cases were mixed coccus and bacillary infections. He believes that the presence of bacilli in urinary infection is dependent upon: 1. A prior acute or chronic coccal infection or focus with lowered resistance of the

urinary tract; 2. Structural alteration of the urinary tract such as calculus or obstructive lesions; 3. Accessory genital or adnexal disease. This concept accounts for the frequency of mixed infections and the changing flora noted during the treatment of many protracted infections.

In reviewing the work of several representative investigators, in their series of reported urinary infections, I find that the most common pathogens in urinary infections are *E. coli*, *Aerobacter aerogenes*, *B. proteus*, *Pseudomonas aeruginosa*, *Streptococcus faecalis*, *Streptococcus hemolyticus* and nonhemolyticus, and *Staphylococcus aureus*, and these are the bacteria with which we are most concerned.

The technique of identification of these bacteria is classic and is based upon their colony forms on eosin methylene blue and blood agar plates, their ability to ferment lactose or dextrose with or without acid and gas production, ability to hydrolyze urea, liquify gelatine and produce pigment. The details of this bacteriological identification may be found in standard laboratory texts. It is felt that where bacteriological laboratory facilities are available, this or similar routine identification should be available to all who treat the complicated or protracted urinary infection.

I may not take the time here to discuss sensitivity determinations of isolated bacteria to the several antibiotics. This study is and will become even more important in planning proper treatment of protracted infections.

Prior to the advent of the use of sulfonamides ten years ago, the treatment of urinary infections depended entirely upon the removal of calculi, correction of obstructive lesions, and the alteration of urinary hydrogen ion concentration to produce an environment unfavorable to the growth of the offending organism. Those bacteria producing a strongly alkaline urine were treated by efforts at acidification of the urine and not without some success. However, during this period, two urinary antiseptics were offered representing the first definitive step toward specific therapy; methanamine, an oral medication excreted by the kidney and at a pH of 5.5 freeing formalin in the urine, and mandelic acid, found to be excreted by the normal kidney with urinary antiseptic properties similar to those produced by a ketogenic diet. More recently a salt methaenamine mandelate, known as mandelamine, has been offered. Kirwin reports

83 per cent clinical cures in urinary infections with its use. Carroll and Allen report favorable results in 85.6 per cent of *E. coli*, 71.4 per cent of *Staphylococcus aureus*, and 62 per cent of streptococcus urinary infections, including *Streptococcus faecalis*. Other reports show a comparable result with the use of sulfathiazole, streptomycin, and mandelamine, and they further found that organisms developing increased resistance to sulfathiazole and streptomycin, remained sensitive to mandelamine. This drug is contraindicated in cases of impaired renal function and may cause nausea and dysuria in a few cases. It may be administered as three or four tablets four times daily for several weeks, if necessary. It is most effective against *E. coli*, *Staphylococcus aureus*, and *Streptococcus faecalis*.

The introduction of sulfonamide therapy beginning with sulfanilamide, has marked the advent of definitive treatment of common urinary infections. In rapid succession, all claiming a wide spectrum of effectiveness, have evolved sulfathiazole, sulfadiazine, the intestinal sulfonamides, sulfacetimide now known as sulamyd, and gantrisin introduced as NU 445. Others, which are less commonly used, need not be mentioned but are not ineffective in the hands of many. Most are effective with *E. coli*, *A. aerogenes*, *Staphylococci*, and many beta hemolytic *Streptococci*. To a lesser extent, they are effective against *B. proteus* and *Streptococcus faecalis*. Only *Pseudomonas* is resistant in most strains.

The simplicity of administration and the practical value of the sulfonamides in most urinary infections must be balanced by their serious side effects. The danger of crystal formation and mechanical tubular and ureteral obstruction has been reduced by hydration, alkalinization of the urine, and by combining small quantities of two or more sulfonamides. These commercially produced mixtures combine the safety and the solubility of each small quantity component with a high therapeutic effect of the mixture. These combinations and mixtures have nearly replaced the use of sulfathiazole and sulfadiazine alone. In addition to the danger of crystalluria, sulfonamides may produce hyperpyrexia and skin lesions in previously sensitized patients. Agranulocytosis, hemolytic anemia, and lower nephron nephrosis must be constantly watched for by regular blood studies and attention to urinary volume during the period of treatment. The

newer sulfonamides such as Sulamyd and Gantrisin have eliminated the danger of crystalluria but none have eliminated the danger of serious hematopoietic complications with their use.

Sulfathiazole, sulfadiazine, or combinations, are effective against most strains of *E. coli*, *A. aerogenes*, *Staphylococci*, and some strains of *B. proteus* and *Streptococcus faecalis*.

The intestinal sulfonamides, sulfasuxidine, and sulfathalidine control nearly all *E. coli* urinary infections. Their use in pyelonephritis of pregnancy and in recurrent urinary infections have been demonstrated to be practical.

Sulamyd, or sulfacetimide, is effective against *E. coli*, *A. aerogenes*, and many strains of *Staphylococcus aureus*, *Streptococcus faecalis* and *B. proteus*. Toxic reactions, both acute and chronic, are rare and its rapid elimination by the kidney results in low tissue levels. Most important, it is very soluble and crystalluria and anuria probably does not occur. The initial dose is four grams a day for three days then the dose is reduced to three grams daily for seven days, and is given at eight hour intervals.

NU 445 or gantrisin also is well tolerated without toxicity in most cases. It is highly soluble in both acid and alkaline urine so that alkali administration is unnecessary. Intravenous and intramuscular routes may be used. The oral administration of six to ten grams daily for ten to fourteen days is well tolerated and is very effective against *B. proteus*. Gantrisin is also effective against *E. coli* and *Alcaligenes* and *Pseudomonas*. It is ineffective against *Paracolon*, *A. aerogenes*, and *Streptococcus faecalis*.

Penicillin is ineffective against all gram negative bacilli. In spite of this fact, it is probably the most widely used medication in urinary infections. The unconsidered use of penicillin alone in these infections is to be condemned, but, if used together with sulfonamides or other antibiotics, it is entirely acceptable. Penicillin is highly effective against gram negative and gram positive cocci with the exception of *Streptococcus faecalis*. In mixed infections, its use, combined with a sulfonamide, or another antibiotic is necessary although Carroll advises that the gram negative bacilli be eradicated first, before administering penicillin. The oral or parenteral routes of administration may be used and both are equally effective in adequate dosage.

Streptomycin held great promise as a potent antibiotic substance in urinary infections. Its

specific action against many bacteria resistant to sulfonamides and penicillin has been demonstrated. Its value to the urologist is unquestioned. Yet, like penicillin, its ease of administration has led to serious abuses. Streptomycin has been said to be a "one time" antibiotic, in that its readministration in a recurrent or uncured patient is of no value because of the development of resistant strains of bacteria from previous exposure to the agent. It follows therefore that streptomycin should not be administered to a patient with urinary infection until study for calculi or obstructive uropathies has been completed. In fulminating infections of serious magnitude, exception to this rule is justified. But, generally, it is advised that streptomycin be given only to those patients shown to have no correctable anatomical defects of the urinary tract, who do not require catheterization and whose infecting urinary organisms are sensitive in a therapeutic range as determined by *in vitro* studies.

Streptomycin is effective against *E. coli*, *B. proteus*, *A. aerogenes*, and to a lesser extent against *Paracolon* and *Alcaligenes*. It is not effective against *Pseudomonas* or *Streptococcus faecalis*. Four tenths of one gram every four hours will produce blood level of 16 micrograms per milliliter and a urine concentration of over 1000 micrograms per milliliter; a level that will inhibit the growth of most susceptible organisms. The effectiveness of streptomycin is increased at pH 8.0 so that alkalinization is advised. Oral administration is valueless in urinary infections.

Aside from the development of resistance in organisms not quickly cured, there are other disadvantages to the use of streptomycin. In usual therapeutic doses, it is practically non toxic. In larger dosage or after continued use, side reactions of varying severity may occur and are well known to all. These side reactions may be reduced by the use of dihydrostreptomycin without altering the clinical effect.

Aureomycin, introduced in 1948, has proven to be a versatile urinary antibiotic administered either intramuscularly or orally. Peak concentration occurs in three hours after intramuscular injection, and the optimum interval by oral route is three hours for 250 mgm. or six hours for 500 milligrams. The urinary concentration is 100 times that of the serum and it produces an acid urine where its effectiveness is increased.

Aureomycin is most effective against *E. intermedium*, *E. coli*, *A. aerogenes*, *paracolon*, *alkaligenes*, and *Strep faecalis*. Also sensitive are *B. hemolytic* *Streptococci* and *Staphylococcus aureus*. No sensitivity is shown by *B. proteus* and *Pseudomonas*. Aureomycin resistant strains do not develop and its repeated use is therefore possible. There is generally no evidence of toxicity to its use although patient allergy may be developed following repeated use. Nausea following ingestion is not uncommon but is reduced by administering the medication with allumina gels or buttermilk.

Chlormycetin, isolated from *Streptomyces venezuelae*, has now become the first antibiotic to be synthesized. It is well tolerated without toxic or side reactions. It is rapidly absorbed by oral or rectal routes. The dosage is 50 mgm. per kilogram for the acute days of the infection; then reduced in half for periods of five to seven days. Chlormycetin is effective against *E. coli*, *A. aerogenes*, and *proteus*. Also it is effective against *Staphylococci* and *Streptococci*. No effect against *pseudomonas* infections is again noted.

Polymyxin is mentioned here, although its clinical application is as yet premature. Its importance lies in the fact that, other than mandelic acid and mandelamine, it is our only therapeutic measure effective against *pseudomonas* infections. This antibiotic is derived from *B. polyxa* and is very soluble, being administered only by the intramuscular route. The dosage is 2.5 milligrams per kilogram of body weight. With this dosage there is little renal tubular damage or elevation of the blood urea nitrogen. Administration is at six hour intervals for three days. All patients, however, develop neurotoxic reactions such as paraesthesias, hypaesthesias, dizziness, and weakness. Polymyxin is effective against *E. coli*, *A. aerogenes*, *paracolon*, and *Staphylococci*. It is less effective against *streptococci* and useless against *B. proteus*.

Following this rapid and sketchy review of our therapeutic armamentarium, the management of a common urinary infection may be discussed.

In those patients without a previous history of urinary infection, it is sufficient to base the therapy upon the finding of bacteria in the stained sediment of the urine. If gram negative bacilli are found, a sulfonamide, such as sulfadiazine, sulfathiazole, or mixtures, in dosage of

0.5 grams every six hours is prescribed for seven days, with adequate fluid intake and alkalinization used. If gram positive cocci are found, together with the bacilli, penicillin is also given. At the end of one week, the urinary sediment is again examined and if free of pyuria and bacteriuria, it is but necessary to examine the urine for two weeks to be certain recurrences do not occur. Should the infection promptly recur or should the checkup reveal that pyuria persists, cystoscopy and retrograde pyelography is indicated, and at that time, the bladder and ureteral specimens are examined to locate the source of the pyuria and cultured to identify the causative organisms. If sensitivity studies can be made, the appropriate antibiotic can be determined. Should calculus or obstruction be discovered, streptomycin should be withheld until the basic pathology has been corrected. During the period of preparation for surgery, other effective antibiotics or sulfonamides, if indicated, may be used.

In those patients who have had repeated infections of the urinary tract, one may save time by performing cystoscopy and retrograde pyelography with urine cultures at the onset for there is generally a predisposing cause for chronic pyuria.

During the period of specific therapy urinary sediment bacteriology must be repeatedly studied because of the change of flora in resistant mixed infections. Furthermore, in sulfonamide and streptomycin therapy, changes in sensitivity of microorganisms are commonly found, necessitating a change to an effective agent.

Where it is not possible to do sensitivity studies, specific treatment may be based upon a knowledge of effective therapeutic agents for the various urinary pathogens. These may be summarized as follows:

B. coli: most effective are mandelamine, gantrisin, sulamyd, aureomycin, chloromycetin, and streptomycin where its use is not contraindicated. The drugs of choice are streptomycin, aureomycin, and chloromycetin. If long periods of therapy are necessary, the sulfonamides: gantrisin, and sulamyd and mandelamine are recommended.

E. intermedium: This organism is probably of importance only when suspected *E. coli* infection is not promptly cleared with streptomycin. Aureomycin is the drug of choice.

A. aerogenes: this increasingly important secondary invader responds to sulamyd, aureomycin, chloromycetin, and streptomycin, with aureomycin or chloromycetin first choice.

Paracolon: chloromycetin is the antibiotic of choice with sensitivity also noted to streptomycin.

B. proteus: this important urea splitting organism shows strains sensitive to most sulfonamides with sulamyd and gantrisin most effective. Many strains also respond to streptomycin and to chloromycetin. Aureomycin is not recommended since these urines show an alkaline hydrogen ion concentration.

Pseudomonas aeruginosa: this organism was formerly considered harmless. Recently the urologist has come to look upon it as a producer of infection of major significance. The antibiotics are useless except for polymyxin and the safe use of this agent remains somewhat in the future. Mandelamine is the drug of choice and all sulfonamides should be tried.

Alkaligenes: gantrisin and aureomycin are the recommended agents and some strains are sensitive to streptomycin.

Streptococcus faecalis: this enterococcus is a common pathogen, especially in the paraplegic patient. Penicillin is of no value and streptomycin is effective only in a few strains. Furthermore, where reinfection is common, streptomycin is not recommended except in fulminating infections. Mandelamine is very effective, sulamyd is the sulfonamide of choice and aureomycin and chloromycetin are the antibiotics of choice.

Streptococcus hemolyticus: the beta hemolytic organisms are sensitive to sulfonamides. Both alpha and beta hemolytic streptococci are sensitive to penicillin, aureomycin and chloromycetin, with penicillin being recommended.

Streptococcus nonhemolyticus: penicillin is recommended.

Staphylococcus aureus: Many therapeutic agents are effective, including mandelamine, sulfonamide mixtures, sulamyd, aureomycin, and chloromycetin, but most important is penicillin.

In conclusion, three rules of treatment for common urinary infections are offered:

1. Properly collect a urine specimen and identify a causative organism in the sediment before initiating treatment.

2. Investigate recurrent and chronic urinary infections for organic urinary pathology.
3. Utilize a therapeutic agent that shows effectiveness against the infecting organism or which statistically has a chance of being of value.

SURGICAL JAUNDICE

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Perplexing situations arise in the analysis of the causes of jaundice. Whether because of insufficient study, or equivocal or contradictory laboratory data, some patients with obstructive jaundice are not treated surgically. It has been facetiously stated that the great value of the many liver function tests is in the time it requires to perform them, during which the patient may be carefully examined and studied. In a sense this is so, as the daily fluctuation, or its absence, in the intensity of the jaundice or acholia maybe nearly as important in reaching a diagnosis as the history, examination and other laboratory data.

Jaundice results from the retention of bilirubin in the blood stream. Bilirubin is formed from the iron free pigment (hematoidin) of the erythrocytes by the reticulo endothelial cells, and is secreted by the liver in bile. The bilirubin is delivered to the intestines, where by enzymatic activity, it is converted to urobilin. The greater part of this passes out of the body in the stool, giving the stool its characteristic color. Some of the urobilin is delivered again to the liver via the portal system by resorption from the intestine. The liver reconverts some of it to bilirubin.

For practical purposes jaundice may be considered to be hemolytic or prehepatic, hepatocellular or intraphepatic, and obstructive or extrahepatic. In hemolytic jaundice excessive hemolysis of erythrocytes occurs, usually with normal liver function. Thus increased bilirubin is formed giving rise to increased urobilin in intestines and feces. The excess amount of urobilin returned to the liver cannot all be reconverted to bilirubin and spills over in the urine in large amounts. In intrahepatic jaundice excessive spill of urobilin does not occur. In obstructive jaundice inasmuch as little or no bilirubin reaches the bowel fecal and urinary urobilin may be low or negligible.

Differentiation of obstructive from hepatocellular jaundice may be exceedingly difficult. Every physician with extensive experience can bring to mind instances of both types of jaundice in which atypical findings have been present. By and large obstructive jaundice is characterized by seldom presenting in its early phases, at any rate, signs of disturbed hepatic function, and will present symptoms of interference with biliary flow. Painful colics, transient or permanent acholia, retention of biliary products other than bilirubin, and decreased to absent urinary and fecal urobilinogen may be encountered. On the other hand primary hepatic jaundice generally does not show interference with biliary flow into the intestine beyond four or five days, and does show early definite evidence of liver dysfunction.

Reasonable proof of mechanical biliary obstruction should be present before subjecting the jaundiced patient to surgical treatment. The obstruction may be partial or intermittent, as well as complete. If a good history can be elicited of gall stones, of colic, of recurrent biliary obstruction with fever with or without pain, of jaundice following cholecystectomy or of post-operative biliary fistula, there is excellent indication for surgical treatment. Likewise a palpably distended gallbladder, and proved complete and permanent acholia are absolute indications. In all of the above instances liver function should be normal, or compatible with the duration of the jaundice.

There is no absolute protection as yet available against the possibility of occasionally employing surgical therapy where it may be inadvisable, in some instances of chronic hepatitis, cholangitis, compensated cirrhosis and chronic relapsing pancreatitis. In the presence of the following warning signs or symptoms or findings, surgical exploration should be utilized only after due study and thought. One rarely encounters edema, or evidences of collateral circulation, or low serum proteins and reversed albumin-glo-

bulin ratio in obstructive jaundice. A reliable episode of exposure to hepato-toxic agents, to plasma or blood transfusion within sixty to one hundred-twenty days, rather suggests intrahepatic jaundice. Chronic jaundice with splenomegalia, and hemolytic activity are not usually seen in obstructive jaundice. Feter hepaticus indicates rather cirrhosis or hepatic atrophy. Intense jaundice with unobstructed biliary passages fits in with primary carcinoma of the liver or severe hepatic necrosis. Finally reduced cholesterol and cholesterol esters under fifty milligrams per cubic centimeter of plasma indicates severe liver damage, as does failure of hippuric acid synthesis and hypoprothrombinemia refractory to Vitamin K.

A multitude of tests may be employed in an effort to determine whether a given patient's jaundice is due to extra-hepatic obstruction or otherwise. It not infrequently results that contradictory or equivocal findings add confusion rather than shed light on the problem. The use of duodenal drainage has been advocated but is so highly inaccurate as to be relatively valueless unless blood is found on the drainage. The Schmidt test for bile in the stool may be misleading, and result in negative findings when there is merely low bilirubin content in a bulky stool. The use of the Graham-Cole X-ray in the presence of deep jaundice may be meaningless when non-visualization occurs as ordinarily results. A flat roentgen plate of the abdomen may show opaque calculi in the region. In the last analysis the best proof of biliary obstruction lies in the findings of absent or very low values of fecal and urinary urobilinogen. Suggestive findings of biliary obstruction in the blood of the jaundiced patient would be elevation in the alkaline phosphatase and cholesterol and cholesterol esters.

It is imperative that some studies of liver function be performed in the jaundiced patient if mistakes are to be kept to an absolute minimum, for the liver function should be normal or compatible with the duration of the jaundice in those instances which may be benefited by surgical therapy. The cephalin cholesterol flocculation of Hanger and the thymol turbidity tests are very sensitive liver function tests and if they are highly positive great caution should be exercised before recommending operative treatment. The bromsulphalein excretion test is valueless in the presence of jaundice. In most

obstructive jaundices the serum protein, albumin-globulin ratio, and hippuric acid secretion should be normal. Finally a prompt return to normal of prolonged prothrombin time upon the administration of Vitamin K, should occur in the patient where jaundice is due to obstruction. Conversely in intrahepatic jaundice the following are expented: normal alkaline phosphatase, normal or low cholesterol and cholesterol esters, reduced serum protein, reversed albumin-globulin ratio, positive thymol turbidity and cephalin flocculation, decreased hippuric acid secretion, and delayed or absent response to Vitamin K administration.

In the last analysis no amount of scientific data can replace accurate clinical acuity and judgment in the jaundiced patient. If after careful study the cause of jaundice is felt to be obstructive then surgical therapy may be employed after adequate preparations to correct hypoprothrombinemia, hypoproteinemia, hypovitaminosis, anemia, and glycogen depletion. A plea should be made for not lingering too long in reaching a diagnosis and using surgical treatment in those patients who have chills and high fever with obstructive jaundice as some of these patients rapidly develop overwhelming liver infection with multiple abscesses which cannot always be successfully controlled even after relief of obstruction. Finally it should be remembered that jaundice occasionally occurs in amebiasis and ulcerative colitis. These conditions should be excluded where there is any question of their presence before undertaking operative intervention.

The following somewhat abbreviated two examples have been selected to illustrate some of the above points.

1.) C.C.—48 year old, single, Spanish-American male janitor, entered the hospital with a complaint of mild epigastric discomfort relieved by alkalies for three weeks, severe right upper abdominal colic radiated to the back with nausea for nine days, jaundice with light stools and dark urine for eight days. Seven pounds of weight were lost in this period. He admitted taking three bottles of beer and one whiskey shot daily for years, and stated he used to drink heavily. No plasma or blood transfusions had ever been administered him. He admitted gonorrhea ten years before.

Essentials of his examination revealed an afebrile, jaundiced male of the stated age, with

carious teeth, a firm moveable tumor of the occiput 3x4 cm. with no abnormalities except a palpable mass considered to be liver extending four fingers below the right costal margin. One observer felt questionable nodules in the mass. The rectal examination revealed alcoholic stool on the glove.

Laboratory examination revealed 13.9 grams of hemoglobin per 100 c.c.; 4,500,000 r.b.c.; 7,800 w.b.c. per cum. mm; normal differential. Urine normal, except for showing positive test for bile, and urobilinogen. Kahn was negative. Cephalin flocculation was negative. Stool showed no parasites or ova. Icteric index was 60 units. Serum protein was 7.0 grams per 100 c.c. with 3.6 grams albumin and 3.4 grams globulin. Prothrombin time was patient 19 seconds control 16 seconds or 84% of normal. Two days later urobilinogen was weakly positive 1:10. Four days later icteric index was 120 and urobilinogen in the urine was negative. Twelve days later the icteric index was 140, urobilinogen in the urine was still negative, and cephalin flocculation showed 1+ in 48 hours. Flat plate of the abdomen was negative.

In this patient then without previous history suggestive of biliary disease, *very* deep jaundice is seen with normal liver function, as demonstrated in the cephalin flocculation and serum protein and albumin-globulin ratio tests. Proof of total biliary obstruction and over a period of at least eight days is present in the absence of urobilinogen in the urine. The very high icteric index would suggest primary liver carcinoma. Operation revealed multiple whitish-hard nodules throughout the entire liver, biopsy of which showed biliary duct carcinoma of the liver. There were widespread metastases on the omentum and peritoneal surfaces. The gallbladder was greatly distended and contained stones, one of which was impacted in the cystic duct. Palliative cholecystogastrostomy was performed, jaundice was not relieved. The patient recovered from the operation to die one month later from carcinomatosis.

Somewhat more puzzling was the situation with

2.) I.A.—40 year old, single, Spanish-American, farm laborer, entered the hospital with a complaint of epigastric fullness and distress with nausea and undetermined amount of weight loss of six months duration. For one month he had constant epigastric distress, and jaundice without

itching of the skin, but with light stools and dark urine for two weeks.

Examination revealed a chronically ill, deeply jaundiced male with temperature of 101.8°. Except for a moderately distended abdomen with marked tenderness over the epigastrium nothing significant was found on physical examination. The liver could not be felt, no masses could be felt, and no shifting dullness could be demonstrated. Alcoholic stool was demonstrated on the rectal glove.

Over a seventeen day period extensive laboratory studies were made, during which time the patient's temperature fluctuated between 101° and 104° daily with chills. Admission hemoglobin was 11.65 grams per 100 c.c.; r.b.c.; 3,987,000 per cu. mm; w.b.c. 15,600 per cu. mm. of which 95% were polys, 5% lymphocytes. Icterus index was 50 U, 50 U and 40 U in this period. Prothrombin time was 64% of normal, and after four days with Vitamin K administration was still 64% of normal. N.P.N. was 30 mgs. per 100 c.c. of blood. Urine was positive for bile and showed positive for urobilinogen in 1:80 dilution. Alkaline phosphatase showed 17.3 units by King Armstrong method. Cholesterol of the blood was 243 mgms. per 100 c.c. blood. Amylase was 42, 25 and 38 mgm. per 100 c.c. blood. Serum albumin was 4.10 grams per 100 c.c. blood and globulin 2.00 grams per 100 c.c. blood with a total protein of 6.10 grams per 100 c.c. of blood. The albumin-globulin ratio was 2.051. There was no free HCl in the stomach. Stools were negative for parasites and ova. Blood cultures were negative. Na malarial parasites were seen on smears. Agglutinations for typhoid, paratyphoid, proteus X and Brucella were negative. There was no response to emetine hydrochloride. The Kahn was negative.

In this patient then conflicting data are present. A rather constant jaundice level is seen of 40 to 50 icteric index units, although clinically it seemed more intense. Some evidence of liver damage is seen in a two plus cephalin flocculation test, elevated alkaline phosphatase, and failure of response of prothrombin time upon administration of Vitamin K. Yet serum proteins and albumin-globulin ratios were normal, as was serum cholesterol. Obstruction could not have been complete with urobilinogen still in the urine. X-rays not previously mentioned showed non-functioning of the gallbladder, as would be expected with this degree of jaundice,

and the gastrointestinal series was negative. Chest X-ray showed chronic fibrous pleuritis of the right base, with calcifications of the left lung field. An electrocardiogram showed only non-specific myocardial damage.

In spite of the conflicting laboratory findings clinically the patient seemed to have obstructive jaundice without evidence of cirrhosis and the medical consultant made a diagnosis of obstructive jaundice due to carcinoma of the pancreas. The surgical consultant made a diagnosis of obstructive jaundice probably due to carcinoma of the liver, gallbladder or pancreas.

At the operation, after careful preparation with transfusions, etc., a greatly distended gallbladder and common duct the size of a silver dollar were found. The pancreas was normal. Opening of the common duct failed to reveal the cause of the obstruction at the Ampulla of

Vater. Transduodenal exploration then revealed a 1½ cm. in diameter adenocarcinoma of the Ampulla of Vater without gross evidence of metastases.

Despite adequate relief of biliary obstruction the patient succumbed in twenty days from cholangitis, minute liver abscess, and bronchopneumonia. This occurred even in spite of vigorous use of antibiotics, pre and post-operatively and serves to illustrate the need for early relief of jaundice due to obstruction with patients having chills and high fever.

In conclusion:—patients with true obstructive jaundice should be treated surgically, and, at a time as early as possible after an accurate diagnosis is made and proper preparation completed. If complications such as cholangitis and liver damage are to be kept minimal.

BASIC SCIENCE SEMINAR

PIMA COUNTY GENERAL HOSPITAL
TUCSON MEDICAL CENTER — ST. MARY'S HOSPITAL
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PHARMACOLOGY OF DIGITALIS & RELATED COMPOUNDS

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Digitalis and certain closely related drugs have in common a specific and powerful action on the myocardium which is unrivaled in value for the treatment of heart failure. These cardiac drugs are mainly of plant origin but are also present in the cutaneous secretions of certain toads. The preparations commonly used are obtained from three groups of plants; the foxglove or digitalis group, the strophanthus group, and the "sea onion" or squill group.

HISTORY

As is true of many valuable modern drugs, the cardiac glycosides were probably first used to kill rather than to heal. At least many of the plant extracts used by natives in various parts of the world as arrow and ordeal poisons contained cardiac glycosides. However, the ancient Egyptians knew squill as a medicine as early as 1500 B. C., and the Romans employed it as a diuretic heart tonic, and emetic; as well as a rat poison. Strophanthus was introduced into medicine by Sir Thomas Fraser in 1890 who discovered its

digitalis-like action while studying African arrow poisons. A drug which has been used for centuries by the Chinese is the dried skin of the common toad. Powdered toad skins were also commonly employed in the folk medicine of western countries for dropsy until replaced by digitalis.

Digitalis or foxglove was mentioned as early as 1250 in the writings of Welsh physicians and was described botanically by Fuchs in 1542. Fuchs gave it the name *Digitalis purpurea* because the flower was purple and resembled a finger. For two hundred and fifty years more, foxglove was occasionally used internally or locally for a number of unrelated diseases ranging from epilepsy to skin ulcers.

It remained for William Withering, master physician and botanist of Birmingham, England to recognize and record the specific pharmacological actions of digitalis. And if it hadn't been for Withering's unusual interest and broad knowledge of botany the discovery of digitalis as a

specific for cardiac failure may have waited another few centuries. It seems that, and I quote from Withering's famous monograph on the subject, "In the year 1775, my opinion was asked concerning a family receipt for the cure of the dropsy. I was told that it long had been kept a secret by an old woman in Shropshire, who had sometimes made cures after the more regular practitioners had failed. I was informed also, that the effects produced were violent vomiting and purging; for the diuretic effects seemed to have been overlooked. This medicine was composed of twenty or more different herbs; but it was not very difficult for one conversant in these subjects, to perceive, that the active herb could be no other than Foxglove."

Withering apparently knew that digitalis was effective only in certain forms of dropsy or edema for he also wrote:

"Independent of the degree of disease, or of the strength or age of the patient, I have had occasion to remark, that there are certain constitutions favourable, and others unfavourable to the success of the Digitalis."

"From large experience, and attentive observation, I am pretty well enabled to decide upon this matter, and I wish to enable others to do the same; but I feel myself hardly equal to the undertaking. The following hints, however, aiding a degree of experience in others, may lead them to accomplish what I yet can describe but imperfectly."

"It seldom succeeds in men of great natural strength, of tense fibre, of warm skin, or florid complexion, or in those with a tight and cordy pulse."

"If the belly in ascites be tense, hard, and circumscribed, or the limbs in anasarca solid and resisting, we have but little to hope."

"On the contrary, if the pulse be feeble or intermitting, the countenance pale, the lips livid, the skin cold, the swollen belly soft and fluctuating, or the anasarcaous limbs readily pitting under the pressure of the finger, we may expect diuretic effects to follow in a kindly manner."

Although Withering observed that digitalis was effective only in certain forms of dropsy he apparently did not associate this with the cardiac action of the drug. He recognized that the heart was affected, however, for he wrote that, "It has a power over the motion of the heart to a degree yet unobserved in any other medicine, and this power may be converted to

salutary ends." Apparently John Ferriar in 1799 was the first to ascribe to digitalis a primary action on the heart and to relegate the diuretic effect to a secondary role.

Whereas Withering knew and recorded the benefits to be derived from the proper use of foxglove, his advice was not always taken. During the 19th century, digitalis was used indiscriminately, often in toxic doses, for many disorders. During the early 20th century, as a result of the work of Cushuy, Mackenzie, Lewis and others, the drug gradually came to be looked upon as a specific in the treatment of auricular fibrillation. Only within the last 20 years has it become firmly established that the main value of digitalis is in the therapy of congestive heart failure.

SOURCE AND COMPOSITION OF THE CARDIAC GLYCOSIDES

In Withering's time little or nothing was known of the specific active compounds contained in the foxglove and other related plants that gave them their observed pharmacological actions, and even today official digitalis is still designated as the dried leaf of the foxglove plant *Digitalis purpurea*, the flowering biennial common in many parts of the United States. However, other members of the digitalis species contain the same compounds and other active cardiac principles as well. The foremost of these is *Digitalis lanata*.

Official *strophanthus* is obtained from the seeds of the *Strophanthus kombi*, while *Ouabain* is derived from *Strophanthus gratus*. Belonging to the same family is a tropical tree, the common name of which is the yellow oleander, that produces a fruit known as the bestill or Malayan nut. The kernel of this nut yields the active cardiac principle thevetin.

Official squill comes from the dried fleshy bulb of the "sea onion", *Scilla Maritima*.

Many other plants contain digitalis-like compounds, but they will not be considered in this paper because their clinical value has not yet been fully established.

The active compounds contained in all these cardiac drugs are glycosides and are closely related chemically. Each glycoside is made up of an aglycone or genin together with one or more molecules of a sugar. The pharmacological activity is in the aglycone, but the particular sugars to which the aglycone is attached is thought to control water solubility, cell pene-

SOURCE AND COMPONENT CHEMICAL PARTS OF THE MAJOR CARDIAC GLYCOSIDES

Source	Glycoside	Sugar	Aglycome
Digitalis	Purpurea		
	Deacetyldigilanid A —Glucose=Digitoxin	3 Digitoxose	Digitoxigenin
	Leaves		
	Deacetyldigilanid B —Glucose=Gitoxin	3 Digitoxose	Gitoxigenin
	Gitalin	2 Digitoxose	Gitaligenin
	Seeds	Digitalin*	Glucose and Digitalose
			Digitaligenin
Digitalis	Lanata		
	Digilanid A —Glucose=Digitoxin	3 Digitoxose	Digitoxigenin
	Leaves		
	Digilanid B —Glucose=Gitoxin	3 Digitoxose	Gitoxigenin
	Digilanid C —Glucose=Digoxin	3 Digitoxose	Digoxigenin
Strophanthus S. Gratus S. Kombe	Quabain	Rhamnose	Quabagenin
	K-Strophanthin	Glucose and Cymarose	Strophanthidin
	K-Strophanthoside	2 Mol. Glucose and Cymarose	Strophanthidin
Squill	Scillaren A	Glucose and Rhamnose	Scillaridin A

*Not commercial "Digitalin".

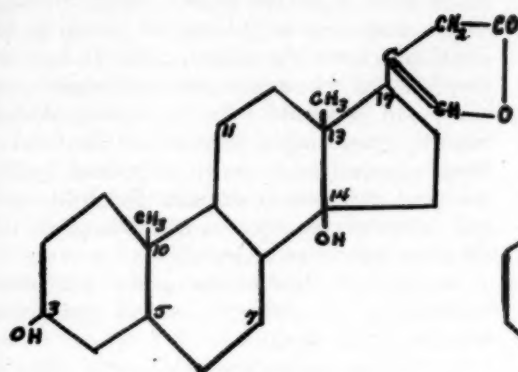
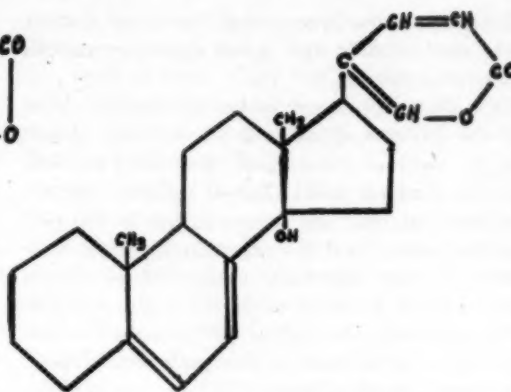
FIGURE 1

trability, and persistence of cardiac action; therefore, the therapeutic potency of the molecule. For example, the sugars are inactive when given alone, but when linked to aglycones the potency and toxicity of the aglycones are increased several fold. All of these sugars are monosaccharides. Some are well known, such as glucose and rhamnose. Others, such as digitoxose and digitalose, are unusual pentose sugars which are found only in the digitalis glycosides and are unlike any known sugars. The following table (Figure 1) indicates the source and component chemical parts of the major cardiac glycosides.

Rapid advances have been made in recent years in the complicated chemistry of the cardiac aglycones. They can be released from the cardiac glycosides either by acid or enzymatic hydrolysis. Their complex structure was but poorly understood until it was discovered that they are chemically related to the bile acids, cholesterol, sterols, and sex hormones. The

basic structure is a clyclopentenophenanthrene nucleus to which is attached a lactone ring. Methyl, hydroxy, and aldehyde groups are also attached in specific positions, varying with the particular aglycone. The empiric formula is usually $C_{23}H_{34}O_{(4-8)}$. In order to show the close structural relationship between the molecules of the different aglycones, the structural formulas of digitoxigenin and scillardini-A will be demonstrated (Figure 2).

Other important aglycones differ structurally from digitoxigenin and scillaridin-A only in minor ways. Gitoxigenin, which is found in digitalis leaves with digitoxigenin, differs from digitoxigenin only in having an hydroxy group at C_{10} . Strophanthidin is different from digitoxigenin only by an hydroxy at C_3 and an aldehyde group at C_{10} in place of a methyl radical. Digoxigenin, a third digitalis aglycone found in the *Digitalis lanata* species has the same carbon skeleton but it also has a third hydroxy group the position of which has not definitely

DIGITOXIGENINSCILLARIDIN-A

been determined. Ouabagenin, from ouabain, has the same structure as digitoxigenin except for a $\text{C H}_2 \text{ O H}$ group instead of C H_3 on C_{10} and hydroxy groups on C_7 and C_{11} . It can be seen that Scillaridin A, the aglycone of squill, differs from the aglycones of the digitalis-strophanthus group in having an extra C atom. This carbon is in the lactone ring and makes scillaridin-A the intermediate link between the cardiac glycosides and the bile acids.

With many drugs a slight variation in the chemical structure causes marked changes in the pharmacological actions, but so far as is now known this doesn't seem to be true for the cardiac glycosides. Apparently they all produce the same type of cardiac effect, but practically nothing is known of the basic mechanism whereby the effect is produced. It appears that the glycosides enter the cell protoplasm and are there split to release the active aglycones.

CARDIOVASCULAR ACTIONS

It seems unusual that a drug which has been known and used for centuries can still cause so much controversy as to its major site of action, but this is the case with digitalis. There is some disagreement at the present time whether the primary action of digitalis-like compounds is on the myocardium of the heart or on the blood vessels. Some competent workers maintain that the primary action of digitalis is to lower the venous pressure and by this means remove the venous congestion of the failing heart and allow it to recover its efficiency. It is claimed that the site of action of therapeutic doses is on the peripheral vessels, in particular

on those of the liver. Digitalis is said to constrict the smooth muscle in the hepatic vein, pool the blood in the liver and portal system, relieve the right side of the heart of the overdistention caused by venous congestion, and in this manner improve cardiac function. Only toxic doses of the glycoside are admitted to be capable of action directly on the heart, and then only to decrease the efficiency of the heart so far as cardiac output is concerned. Evidence in support of this interpretation has been obtained especially in experiments on the dog (Dock and Tainter, 1930; Katz and collaborators, 1938). The work of McMichael and co-workers in 1944 and 1946 also suggested that the primary action of digitalis was on the great veins. All of these experiments, (with the exception of those of McMichael and co-workers), were carried out on the dog and assume that digitalis acts on the hepatic veins of man as it does in the dog.

There are, however, many observations against this interpretation. First, according to most observers, heart failure is the cause rather than the result of increased venous pressure. Secondly, the venous pressure in marked congestive failure is insufficient to be a factor in stretching of the right ventricle. Thirdly, in isolated left ventricular failure, digitalis causes restoration of compensation without significant change in venous pressure. Fourthly, digitalis causes a decrease in the size of the swollen liver in congestive failure rather than an increase which is necessitated by the above theory. Fifthly, the amount of smooth muscle in the hepatic veins

of man is quite sparse and forms no distinct sphincter as does the more abundant smooth muscle in the dog.

Finally, what seems to be the decisive blow to the peripheral vascular theory was struck by the work of Ferrer and co-workers in 1949. In this study a double lumen catheter was introduced so that one lumen rested in the pulmonary artery and the other in the right ventricle. Under carefully controlled conditions the changes in pressure in the right ventricle and pulmonary circulation was measured before and after digitization in five patients with pure left sided heart failure. Digoxin, the digitalis preparation used, produced a significant rise in cardiac output and stroke volume accompanied by a decrease in pulmonary arterial pressure in each of these five patients. These changes were effected without alteration in the right ventricle end diastolic pressure, thus leading to the conclusion that in man at least the primary site of action of the drug was on the myocardium and not upon the systemic venous system.

It seems inescapable from the above observations in man and from observations on strips of heart muscle, in isolated mammalian hearts, in heart-lung preparations, and in experiments of various types in intact animals that digitalis acts on the myocardium to make it work more efficiently. But even though it is at the present time the general consensus of opinion that digitalis does act directly and primarily on the myocardium, there are two major schools of thought as to how it acts on the muscle fibers. One school believes that digitalis shortens the diastolic length of the muscle fiber, thus increasing the muscle tone and therefore the efficiency. This school minimizes the idea of an increase in force of systolic contraction. Stewart and Cohn have been the major exponents of this theory of action. In a recent article Stewart states as follows:

"It is my notion that the human heart observes to a large extent Starling's Law: with dilatation of the heart and increase in length of muscle fibers, the cardiac output first increases; as stretching proceeds farther, the lengths of muscle fibers exceed their optimal length and the cardiac output now falls off. One explanation of the observed effects of digitalis on the large dilated failing heart is as follows: Digitalis exerts an effect on lengths of muscle fibers; namely, decreases them, and the summated effect on all

fibers is to make the heart a smaller pump. The consequence in the normal person is for digitalis to make the heart smaller, in fact too small, so that the cardiac output decreases since the pump is smaller. In the failing, dilated heart the shortening of the stretched fibers makes them approach more nearly an optimal length, the heart decreases in size and the cardiac output increases. In this notion we think the effect on heart size is crucial."

"Everyone of these effects can be easily demonstrated in man from the use of therapeutic amounts of the drug."

"In strips of cat heart muscle another effect of digitalis can be demonstrated, namely an increase in force of contraction. This effect no doubt contributes to the benefit of the drug but it cannot be the main effect, because it would also increase the cardiac output of the normal heart as well as the failing one."

In contrast to the above, Gold and co-workers, and others hold that digitalis bodies are effective in heart failure not by increasing cardiac tone as claimed by Stewart and Cohn and their associates, but by improving the strength of systolic contraction. Their experiments on papillary muscles and tortoise hearts indicate that digitalis enhances the force of systole without a decrease in diastolic length and throughout a wide range of diastolic lengths. However, with present x-ray techniques it can be shown that the human failing heart does decrease in size after digitalization, and this also seems to be true with normal hearts. Therefore, in view of the evidence on both sides, it seems best in the light of our present knowledge to conclude that digitalis does act primarily on the heart muscle to decrease its diastolic size and to increase the force of systolic contraction.

The idea that digitalis always increases the force of systole does not seem to stand up when one considers the fact that the cardiac output of the normal human heart is decreased from 20 to 35 per cent by digitalis. It looks as if the output should increase with increased force of contraction. However, if we remember that the diastolic size of the normal heart is decreased by digitalis, it becomes apparent that even though the heart muscle contracts more forcefully it is possible for it not to force out as much blood because, due to its decreased size, it doesn't contain as much blood as normally. The cardiac output is also dependent

upon the heart rate, stroke volume, velocity of blood flow, peripheral resistance, and venous return. The important fact remains that digitalis decreases the cardiac output in normal hearts but increases it in failing hearts.

Digitalis also decreases the venous pressure if it is increased as a result of congestive heart failure. A fall of pressure from 20 cm. of water to 5 cm. within 24 hours is not unusual. This decrease in venous congestion is most probably secondary to the improvement which occurs in the circulation and especially to the increased cardiac output and not a result of the action of digitalis upon the peripheral vascular system. In normal patients or in those with isolated left ventricular failure, the systemic venous pressure is not elevated and digitalis has no significant effect on it.

Circulatory volume is changed by the cardiac glycosides. For reasons not fully understood, congestive heart failure is accompanied by an increase in the circulating blood volume. Digitalis and related compounds act to decrease the blood volume and probably do so by restoring cardiac compensation and removing the causes underlying the original increase. In patients with normal hearts, however, digitalis may also cause a diminution in circulatory blood volume. The mechanism of this action is still unknown.

Blood pressure is affected in no uniform manner by the cardiac glycosides, but it is lowered, raised or not changed, as one might predict if one assumes that these glycosides act directly on the myocardium to cause a reversion toward normal. For example therapeutic amounts of digitalis cause no constant or significant change in the blood pressure of normal human beings. In patients with heart failure, the administration of digitalis causes variable changes in blood pressure. As one might expect, the pulse pressure may be increased due to a lowering of diastolic pressure. This lowering may be secondary to a reduction of vasomotor tone elevated by a relative anoxia. The systolic pressure may also fall somewhat, especially if its level was high as a result of over-compensation subsequent to the failure. Low systolic pressures due to decompensation are elevated toward normal as digitalis improves cardiac function. It seems clear, therefore, that digitalis affects blood pressure only through its action on the heart and not by any significant effect on the blood vessels or vasomotor center. The

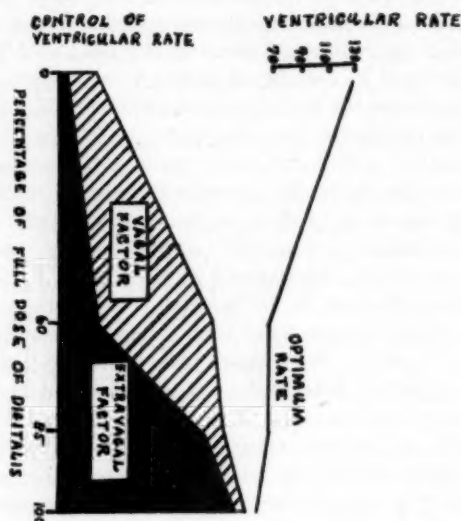
former hesitancy regarding the use of digitalis in hypertensive patients does not appear to have any basis in fact. From the foregoing it would seem that patients who have hypertension and isolated left ventricular failure may be greatly benefited by digitalis.

The mechanical efficiency of the heart muscle appears to be increased by digitalis. Animal experiments indicate that after digitalis the heart is able to do a given amount of work with less consumption of oxygen (Gremels, 1933; Peters and Visscher, 1936). This may be related to the fact that digitalis decreases the diastolic size of the heart, and it has been shown that for a given amount of work the oxygen need of the heart increases as the diastolic size of the heart increases.

Digitalis usually slows the heart rate. However, the present conception of the action of digitalis minimizes the importance of cardiac slowing as a factor in the beneficial effect of the glycoside in heart failure. For many years, the overemphasis placed on the slowing of cardiac rate after digitalis obscured the major and direct action of the drug on the myocardium and also the main indication for its use, namely, cardiac decompensation. Congestive heart failure is often relieved in man by clinical doses of digitalis without evidence of cardiac slowing. Furthermore, if slowing does occur, benefit may be observed earlier than any change in rate. Again, when the rate is decreased by digitalis it is mainly in patients who have a tachycardia accompanying the heart failure. Even in auricular fibrillation where digitalis exerts its most prominent slowing of ventricular rate, the drug usually does not slow the ventricle unless heart failure exists. From these basic clinical observations it is pretty conclusive that digitalis may cause marked improvement in heart failure without intervention of primary cardiac slowing. This conclusion is strengthened by the fact that changes in heart rate are insignificant and variable when full doses of digitalis are given to persons without cardiac failure. The question now remains as to how digitalis brings about ventricular slowing. From early animal experiments and from later work by Gold and co-workers on patients, there appears to be two mechanisms at work. The first mechanism seems to be through the vagus reflexly by way of the carotid sinus and aortic body. From our present knowledge of physiol-

ogy and in view of the above clinical observations we may assume that the chain of events proceeds in this manner; the heart muscle begins working more efficiently, the cardiac output is increased, more oxygenated blood is present in the area of the aortic body and carotid sinus at any given instant, more afferent impulses travel up the vagus to the cardio-regulatory center, there is improved circulation all over the body and therefore less anoxia, afferent impulses reach the cardio-regulatory center from all over the body probably including the higher centers of the brain which are also less anoxic, more impulses travel down the efferent fibers of the vagus, and the heart rate slows. In other words digitalis causes vagal slowing of the rapid heart rates seen in clinical heart failure by restoring cardiac compensation. That the vagus nerve is involved in this mechanism is proved by the fact that this slowing can be abolished by vagotomy, atropine, or exercise. The fact that exercise abolishes this effect is entirely in agreement with the known physiology of the cardio-regulatory center, and is of some importance in the maintenance of patients with auricular fibrillation. In the treatment of these patients it is not uncommon to find digitalis reducing the rate from 140 to 70 when the patient is at rest. When he is up and about, however, he complains of palpitation and breathlessness. Free physical activity raises the rate to uncomfortable peaks when the mechanism of control is vagal. Fortunately for these patients there apparently is a second mechanism by which digitalis slows the heart rate. This mechanism, for lack of complete understanding of its nature; is called the extravagal action of digitalis. According to Gold, the extravagal mechanism comes more and more into control as the full digitalizing dose is approached. This effect is not abolished by vagotomy, atropine, or exercise. Gold found that when slowing was by the extravagal mechanism, patients with auricular fibrillation rarely showed an acceleration of heart rate above 100 after exercises. This extravagal action of digitalis appears to be due to the depressant action of digitalis on the conduction of auricular impulses through the junctional tissue, and also the result of the direct action of the glycoside on the decompensated myocardium to strengthen the force of its contraction which automatically increases the refractory period of the muscle. A schematic representation of how digitalis seems

to slow the ventricular rate in heart failure will be shown (Figure 3).



There are divergent views as to the effect of digitalis on the coronary blood flow. Some workers believe that the coronary vessels are an exception to the statement that toxic doses are necessary to cause vascular constriction, and they report coronary vasoconstriction from therapeutic amounts (Gilbert and Fenn, 1932). This view has its supporters in the clinical field who contend that digitalis in patients with angina pectoris tends to increase the incidence of attacks of pain. However, Essex, Herrick, and Vischer (1938) using the thermostromuhr method to test the mean blood flow through the circumflex branch of the left coronary artery in trained intact dogs concluded that the glycosides of digitalis lanata have no effect on coronary blood flow, and Gold and coworkers (1938), in a careful and extensive study of 120 selected patients with angina pectoris without decompensation, demonstrated that digitalis does not increase or decrease the incidence of anginal attacks and that even large doses rarely, if ever, produce effective constriction of the coronary arteries.

Withering used digitalis in cardiac dropsy and for many years the foxglove was considered a diuretic. I think it is now generally agreed that digitalis is in no sense a true diuretic and its effects on urine flow are due entirely to its action on the heart and circulation. In normal persons or in patients with heart failure without edema, no diuresis is noted after digitalis. In cases with anasarca due to causes other than congestive heart failure, the glycoside likewise causes no increase in urine output. It seems clear, therefore, that mobilization of edema fluid causes the diuresis and not vice versa. The main cause of edema in congestive heart failure appears to be the increase in hydrostatic pressure in the venous ends of capillaries, preventing the normal resorption of extracellular fluid. As heart failure is relieved and venous congestion reduced, the edema fluid is returned to the blood, and with the simultaneous relief of vascular congestion in the kidney and improved renal function it is then excreted. It must be remembered, however, that despite the effect of digitalis in mobilizing edema fluid in congestive heart failure, about one-half of all patients require additional measures to cause diuresis. Whether this is due to the inability of digitalis to restore full cardiac compensation in these patients is unknown.

Within two to four hours after large oral doses of digitalis, definite alterations may appear in the electrocardiogram. The first changes are noted in the S-T segment or in the T wave itself.

The normally upright T wave may become diminished in amplitude, flat or inverted in one or more leads. The S-T interval may also show depression. Either of these changes may occur alone or both may coincide. These changes seem to be due to a direct action of the glycoside on the heart muscle since they are not abolished by atropine. Of importance is the fact that these changes may simulate those resulting from coronary artery disease or recent coronary occlusion. The P-R interval may also be prolonged by digitalis, and significantly this effect appears somewhat later than those mentioned above. The interval is rarely prolonged greater than 0.25 second. If it is greater than this, pre-existing disease of the conduction system may be assumed. The Q-T portion of the tracing is shortened by digitalis and reflects the fact that the drug lessens the duration of ventricular systole. That the T wave changes usually occur before the P-R interval is prolonged indicates again that digitalis acts first and foremost on the heart muscle itself.

The more important features of the foregoing discussion of the cardio-vascular actions of the cardiac glycosides are summarized in the following table (Figure 4).

DOSAGE ABSORPTION, AND EXCRETION OF THE CARDIAC GLYOSIDES

We have seen from the foregoing discussion of the chemistry of the cardiac glycosides that the active principles of all the preparations are

RESPONSES TO DIGITALIS IN HEALTH AND DISEASE

Effects Of Digitalis On	Patients With Normal Hearts	Patients With Heart Failure
Ventricular Rate	Slight decrease as a rule	Usually decreased if previously rapid
Blood Pressure	No significant change	No uniform or marked effect. May be increased if low, decreased if high
Venous Pressure	No significant change	Decreased if elevated
Cardiac Size	Decreased below normal	Decreased toward normal
Cardiac Output	Decreased	Increased
Velocity of Blood Flow	Increased or decreased	Increased usually
Circulating Blood Volume	Diminished	Diminished
Symptoms	May have lassitude, dyspnea, substernal pain, etc.	Relief of dyspnea, cyanosis, edema, ascites, etc.

FIGURE 4

Preparation	Oral Maintenance Dose	Digitalizing Dose		Absorption of Oral Dose	Oral Toxic Dose	Latent Period	Duration
		Intravenous	Oral				
Digitalis Leaf	0.1-0.2 GM.	0.3-0.4 GM.	1.5-2 GM.	20%	1.8-3 GM.	4-6 Hours	2-3 Weeks
Digitoxin	.05-0.3 MG.	1.2-2.6 MG.	1.2-2.6 MG.	100%	1.7-5.9 MG.	4-6 Hours	2-3 Weeks
Digoxin	0.25-1 MG.	0.8-2 MG.	2-8 MG.	20-50%	2-12 MG.	1-3 Hours	3.7 Days
Gitalin	0.2-0.8 MG.	2-3 MG.	3.65-8 MG.	40%			10 Days
Lanatoside C	0.25-1.5 MG.	0.8-2 MG.	7.5-20 MG.	10%	6-13 MG.	1-2 Hours	3-8 Days
Lanatosides A, B & C.	0.33-1.33 MG.	0.8-1.7 MG.	4-8.9 MG.	20%	4.3-16.3 MG.	2-3 Hours	3-5 Days
Quabain		0.5-1 MG.				1 Hour	1-2 Days
Scillarens A & B	1-3.2 MG.	0.5-1.7 MG.	8-30 MG.	5-10%	18 MG.		4-5 Days

FIGURE 5

very similar chemically and also that minor changes in the chemical formula do not seem to cause much if any change in their action on the heart muscle. However, these minor chemical differences together with the particular sugars combined with the different aglycones apparently have a major effect on the absorption and excretion, and therefore the dosage of the different glycosides. At any rate, it is a well known fact that there is marked variation in the therapeutic dosage of the various preparations. The amount to be given depends upon the glycoside used and upon the route of administration. From these facts it is clear that the physician must be entirely familiar with the preparation he uses, in order to obtain maximum benefit without intoxication. In order to save time and space, I will summarize the differences in absorption, excretion, and dosage of the major preparations now in use in the following table (Figure 5). From this table it can be seen, first, that roughly 1000 times as much digitalis leaf is required to adequately digitalize a patient as is required of the purified glycosides. Since the three active glycosides contained in digitalis leaf are digitoxin, gitoxin, and gitalin, it is evident that the powdered leaf contains much inert matter. Also only 20% of the oral dose is

absorbed. This might be predicted since digitoxin is the only known glycoside that is completely absorbed by the gastrointestinal tract. From these facts we may draw our conclusions regarding the use of our oldest digitalis preparation. There are two outstanding disadvantages. First, digitalis leaf is an impure preparation containing several different chemical compounds, the quantities of which may vary in different crops of the foxglove plant. Therefore the potency of each batch must be checked against a standard powder. Since there are several methods of standardization, one must be thoroughly familiar with the method used for the preparation he prescribes. The second disadvantage of powdered digitalis is the relatively large dose necessary to secure therapeutic benefit, thus increasing the possibility of gastrointestinal irritation. Digitalis leaf does, however, have some advantages. In the first place it is cheaper, and secondly, since it is a relatively dilute preparation, there is a greater margin of safety. For this same reason it is easier to maintain patients without toxic effects. Stewart finds that many physicians after using digitoxin for a while are shifting back to the whole leaf because they have encountered toxicity in certain patients on maintenance doses of digitoxin. He

further states that when intoxication occurs with the whole leaf it passes quickly and it may only be necessary to reduce the dose, or at most to omit the drug for a day or two. On the other hand the pure glycosides have certain advantages: (1) The glycosides can be given in small doses (milligrams); (2) local gastric irritation, while not often seen with powdered leaf unless several tablets are given at once, is practically non-existent with the glycosides; (3) the glycosides can be prescribed by weight and not by biological units because they are of constant chemical composition; and (4) a particular glycoside can be chosen for an individual problem in therapy. An example of this last advantage is the use of a pure glycoside with a short latent period, such as lanatoside C for rapid intravenous digitalization. Since the cardiac glycosides are pure, highly potent, chemical compounds, our present difficulties in their use stem from inadequate knowledge as to the correct amount required to produce the desired therapeutic results. Most of the recent work indicates, for example, that the initial digitalizing dose of digitoxin has been too low, while the maintenance dose too high; thus the increased incidence of digitalis intoxication when the drug is given over a long period of time. Articles by Stewart, DeGray, and others in 1950 place the average digitalizing dose of digitoxin at 1.6 to 2.2 milligrams as compared to the old idea of 1.2 milligrams. They also find that the maintenance dose of 0.2 milligrams is too high usually, and that it is more nearly in the neighborhood of 0.1 milligrams. Finally, in prescribing any of these drugs, we must remember that patients vary in their tolerance to all of the cardiac glycosides. Therefore if we are to use any of these drugs skillfully we must be thoroughly familiar with the therapeutic responses to be expected and the toxic effects that may be encountered. The final assay of the proper dose is on the individual patient.

DIGITALIS INTOXICATION

The toxic effects of digitalis are largely extensions of the therapeutic actions of the drug. A preparation which will not cause digitalis poisoning when given in excess is also one which will not exert any therapeutic effect. I think this is an important point to remember when we are appraising the claims made by pharmaceutical firms for their particular brands of digitalis, its purified fractions or substitutes.

Withering wrote, "The foxglove when given in very large and quickly repeated doses, occasions sickness, vomiting, purging, giddiness, confused vision, objects appearing green or yellow; increased secretion of urine, with frequent motions to part with it; slow pulse, even as low as 35 in a minute, cold sweats, convulsions, syncope, death — — — . I am doubtful whether it does not sometimes excite a copious flow of saliva."

This description applied to the effects of large acute doses because Withering was unacquainted with prolonged use of maintenance amounts of foxglove. Digitalis poisoning, as we usually see it today, is due to the continued ingestion of the drug in amounts greater than are destroyed or eliminated. The effects noted are gastrointestinal, cardiac, and cerebral.

The gastro-intestinal symptoms of anorexia, nausea and vomiting are among the earliest evidences of digitalis overdosage. Anorexia usually occurs a day or more before nausea and vomiting develop. Nausea next develops and may appear in recurring "waves". Vomiting then occurs but at times it may develop without preliminary anorexia or nausea. Nausea and vomiting may be transitory or entirely absent, and they may also be present even before digitalis as a result of the congestive failure. The fact that they are present before digitalis is given is no contraindication to the use of digitalis. Diarrhea may also be noted and rarely it may be the only gastro-intestinal manifestation of digitalis overdosage. The mechanism of the gastro-intestinal symptoms caused by cardiac glycosides has been the subject of considerable investigation. The bulk of clinical and experimental evidence points to the fact that vomiting is reflex in origin and arises neither from irritation of the alimentary tract nor from direct stimulation of the medulla. The exact site of origin of the afferent stimuli in man is still unknown.

The cardiac effects of digitalis overdosage may cause alterations in cardiac rate and rhythm simulating almost every known type of arrhythmia seen clinically. Probably the most frequent cardiac effect of digitalis poisoning is the occurrence of extrasystoles. These usually originate in the ventricle but can arise from the auricle. The cause of the ectopic beats is the increased irritability of the myocardium produced by excessive amounts of digitalis. If the extrasystoles are frequent, the ventricular rate in-

creases and over-shadows a primary slowing. However, the toxic effect on the A-V conduction system may be the major one to cause extreme slowing of the heart. The usually accepted rule is to stop digitalis if the ventricular rate falls to 60 beats per minute or below. Toxic amounts of the cardiac glycosides may also cause sufficient prolongation of the A-V conduction to produce dropped beats and at times complete auriculoventricular dissociation. Sinus arrhythmia occurs as an early and minor toxic effect of digitalis and since it can be abolished by atropine it is probably vagal in origin. Paroxysmal tachycardia may arise either from the ventricle or auricle and call for discontinuance of the drug. Auricular fibrillation can be caused by large doses of digitalis. The occurrence of this arrhythmia usually calls for the temporary discontinuance of the drug. That digitalis overdosage can cause fibrillation of the auricles is not a contraindication to the use of the drug in that condition. Ventricular fibrillation is probably the commonest cause of death from digitalis poisoning. It is preceded by ventricular extrasystoles.

Among the common cerebral effects of digitalis are headache, fatigue, malaise, and drowsiness. Mental symptoms include disorientation, confusion, aphasia, and even delirium and hallucinations. Convulsions have been known to occur. These effects are particularly prone to develop in elderly arteriosclerotic patients and the exact role played by digitalis is uncertain. Vision is often blurred. White borders or halos may appear on dark objects ("white vision"). Color vision may be disturbed and objects appear yellow and green, or less frequently blue and red. Transitory amblyopia, diplopia and scotomata may also occur. An explanation for these cerebral effects of the cardiac glycosides is not available.

INDICATIONS AND CONTRAINDICATIONS

The indications for digitalis are sharply defined. It is a potent drug and should be given only when indicated. When given to the normal subject it decreases the cardiac output as much as 30% and decreases the size of the heart. The subject may suffer angina on effort because of the decline in cardiac output. The indications for digitalis are in the main two (1) congestive heart failure, either in the acute stage, such as in pulmonary edema, or in the more chronic forms, and (2) certain irregularities of the heart rhythm.

Some special aspects of congestive heart failure where digitalis may be used are acute myocarditis when heart failure occurs. In active rheumatic carditis it must be used carefully in order not to precipitate toxic manifestations.

It may be used in myocardial infarction when heart failure occurs early or late. About the end of the first week or ten days the possibility of rupture because of more vigorous action of the heart must be kept in mind.

It is used in ventricular paroxysmal tachycardia only when quinidine will not stop an attack and heart failure occurs.

It is used in the presence of congestive heart failure due to hyperthyroidism whether auricular fibrillation or normal rhythm is present. More than the usual amounts may be required to reduce the ventricular rate when auricular fibrillation prevails. Digitalis should be continued in auricular fibrillation until after propylthiouracil and or thyroidectomy have provided an opportunity for spontaneous reversion to normal rhythm before quinidine is tried. It is used if auricular flutter is present.

Christian suggests the use of digitalis in organic heart disease before the onset of failure in order to prevent or delay the onset of failure. The drug has not been used to any great extent for this purpose because it is difficult to prove that benefit results.

With regard to rhythm irregularities, it may be used to stop auricular premature contractions when they give rise to symptoms. It may be tried if other measures, such as sedatives, have not been effective.

In auricular fibrillation it has the following uses:

1. It is employed to slow the ventricular rate.
2. It may cause reversion to normal sinus rhythm, but there is no evidence that digitalis "fixes" this rhythm.
3. It may prevent recurrences of paroxysmal auricular fibrillation in some patients who are not benefited by quinidine.

It is usually the drug of first choice in the treatment of auricular flutter. It first increases the degree of auriculoventricular block and then causes reversion to normal rhythm. There may be a transit phase of auricular fibrillation. More than the usual therapeutic amount may be required before reversion to normal rhythm occurs.

Digitalis may be used when there is failure in the presence of complete heart block or incom-

plete heart block if the block is not due to digitalis.

Stewart believes that the cardiac glycosides are the drugs of first choice in treating the supraventricular paroxysmal tachycardias, such as auricular paroxysmal tachycardia and auriculoventricular paroxysmal tachycardia. He recommends 0.1 gm. to 0.3 gm. of the powdered leaf to terminate supraventricular paroxysmal tachycardia or auricular flutter in very young infants. Rapid digitalization with lanatoside C has been recently recommended in the treatment of these rhythms in adults; 0.8 mg. may be given intravenously. If there is no response in thirty minutes to one hour, another 0.8 mg. is injected intravenously. In other instances, 1.6 mgm. may be given in one dose.

Digitalis is contraindicated in the presence of ventricular paroxysmal tachycardia, unless heart failure occurs and quinidine will not terminate the attack.

It is contraindicated if ventricular premature contractions are frequent, but if the premature beats are due to congestive heart failure they may disappear upon digitalization. However, on the other hand, ventricular premature contractions may be increased in number by digitalis and ventricular paroxysmal tachycardia may be precipitated.

The cardiac glycosides are contraindicated in the presence of chronic constrictive pericarditis unless auricular fibrillation is present, in which case it is used to keep the ventricular rate slow.

They are contraindicated in the presence of hypersensitivity of carotid sinuses, as they may precipitate attacks because of their vagal effects. If heart failure is present and a digitalis preparation is required, the drug may be used and atropine given at the same time in order to prevent attacks.

Digitalis is contraindicated in the presence of transient complete heart block with Adams-Stokes attacks, because it may induce attacks and slow the ventricular rate further.

Calcium salts should not be used intravenously when the patient is digitalized, as death has been reported from its synergistic action with digitalis. In animals, ventricular premature contractions are more easily induced when digitalis and calcium are given at the same time than when either one is given alone.

Ventricular paroxysmal tachycardia and ventricular fibrillation have been reported as re-

sulting from the use of quinidine and digitalis simultaneously. It seems safer when quinidine is to be used in the treatment of auricular fibrillation, to first retard the ventricular rate with digitalis which is then discontinued after which quinidine is given. This same plan may be followed in the treatment of auricular flutter if digitalis does not cause reversion.

There are a few papers dealing with the combined use of digitalis and large amounts of quinidine in the treatment of chronic auricular fibrillation and supraventricular paroxysmal tachycardia. The general opinion appears to be that extreme care should be exercised in this procedure.

Digitalis is generally believed to be without benefit in the treatment of angina pectoris and therefore should not be used unless heart failure is present.

SUMMARY

1. The cardiac glycosides have a specific and powerful action on the myocardium which is unrivaled in the treatment of heart failure.

2. These drugs are all closely related chemically and appear to vary little if any in their action on the heart.

3. The active chemical compounds are aglycones or genins which when combined with certain sugars form the pure glycosides.

4. The particular sugars with which the aglycones are combined seem to have a marked effect upon the gastro-intestinal and myocardial absorption of the glycosides, thus causing a wide variation in their therapeutic dosages.

5. The general concensus of opinion is that the primary site of action of these drugs is on the heart muscle.

6. The mechanism of this action is to shorten the muscle fibers and cause the heart muscle to contract more forcefully.

7. Digitalis brings about cardiac slowing by two major mechanisms; vagal and extravagal.

8. The mechanical efficiency of the heart is apparently increased by the cardiac glycosides for the heart is able to do more work per unit of oxygen used.

9. The diuretic effect of the cardiac glycosides is secondary to improved cardiac function.

10. There is marked variation in the dosage, absorption, and excretion of the different cardiac glycosides, and there is also a rather wide variation in the tolerance of different patients to these drugs. It therefore is mandatory that the

physician know the drug he is using, the therapeutic responses to be expected, and the toxic effects that may be encountered.

11. The indications for the cardiac glycosides are sharply defined and they should not be used indiscriminately because they lower the cardiac output and may cause anginal pain in patients with normal hearts.

REFERENCES

1. Best, C. H. and Taylor, N. B.: The Physiological Basis of Medical Practice. Baltimore, The Williams and Wilkins Company, 1950.
2. Current, J. H. and Woodard, R. C.: Ann. Int. Med. 26:120, 1947.
3. deTakats, G., Trump, R. A. and Gilbert, N. C.: J. A. M. A. 125:840, 1944.
4. DeGraff, A. C., Batterman, R. and Rose, O. A.: J. A. M. A. 138:475, 1948.
5. DeGraff, A. C.: Med. Clin. N. Am., May, 1950.
6. Enselberg, C. D., Altchek, M. R. and Hellman, E.: Am. Heart J. 40:919, 1950.
7. Erickson, E. W.: Proc. Staff Meet. Mayo Clin. 20:263, 1945.
8. Ferrer, I., Richards, D., Harvey, R., Cathcart, R. and Curnaud, A.: Am. J. Med. 7:439, 1949.
9. Freedberg, A. S. and Blumgart, H. L.: New England J. Med. 227:874, 1942.
10. Freedberg, A. S. and Zoll, P. M.: New England J. Med. 235:938, 1946.
11. Friedman, M. and Bine Jr., R.: Am. Heart J. 35:984, 1948.
12. Friedman, M. and Bine Jr., R.: Am. J. M. Sc. 214:633, 1947.
13. Gold, H., Kwit, N. T., Cattell, M. and Travell, J.: J. A. M. A. 119:928, 1942.
14. Gold, H.: J. A. M. A. 132:547, 1946.
15. Goodman, L. and Gilman, A.: The Pharmacological Basis of Theapeutics. New York, The Macmillan Company, 1941.
16. Herrmann, G. R., Decherd, G. M. and McKinley, W. F.: J. A. M. A. 126:760, 1944.
17. Herrmann, G. R., Decherd, G. M. and McKinley, W. F.: J. A. M. A. 126:973, 1944.
18. Levine, H. D.: Ann. Int. Med. 29:822, 1948.
19. Master, A. M.: J. A. M. A. 137:531, 1948.
20. Meakins, J. C.: Ann. Int. Med. 16:327, 1942.
21. Nicholson, J. H.: New England J. Med. 229:619, 1943.
22. Stewart, H. J. and Newman, A.: Am. Heart J. 36:5, 1948.
23. Stewart, H. J.: Med. Clin. N. Am., May 1950.
24. Willis, F. A. and Keys, F. E.: Proc. Staff Meet., Mayo Clin. 16:359, 1941.

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The Editor sincerely solicits contributions of scientific articles for publication in ARIZONA MEDICINE. All such contributions are greatly appreciated. All will be given equal consideration.

Certain general rules must be followed, however, and the Editor therefore respectfully submits the following suggestions to authors and contributors:

1. Follow the general rules of good English, especially with regard to construction, diction, spelling, and punctuation.
2. Be guided by the general rules of medical writing as followed by the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. (See MEDICAL WRITING by Morris Fishbein.)
3. Be brief, even while being thorough and complete. Avoid unnecessary words. Try to limit the article to 1500 words.
4. Read and re-read the manuscript several times to correct it, especially for spelling and punctuation.
5. Submit manuscript typewritten and double-spaced.
6. Articles for publication should have been read before a controversial body, e.g., a hospital staff meeting, or a county medical society meeting.

The Editor is always ready, willing, and happy to help in any way possible.



Editorial

ANNUAL MEETING
AMERICAN MEDICAL ASSOCIATION
ATLANTIC CITY — NEW JERSEY

The Conference of Presidents and other Officers of State Medical Associations convened in Atlantic City, N. J., Sunday, June 10, 1951, at 2:00 P.M., Julian P. Price, M.D. of Florence, South Carolina, presiding. Attendance was in excess of 500, including many members of the

House of Delegates and, with an excellent program, possibly will be recorded as the most outstanding of its sessions thus far.

W. Andrew Bunten, M.D., of Cheyenne, Wyoming, Past President of the Wyoming State Medical Society and President-Elect of this Conference presented the subject: "A Physician Views Medicine". He reviewed the history of medicine and its service to mankind; the progress and achievements in combating disease; portrayed the physician's role as family counselor; the growth of voluntary health insurance plans; and emphasized the need for the physician to assume his rightful place and leadership in civic programs and if need be, seek legislator membership. He stated: "No one possesses a more intimate knowledge of the American Way of Life than does the physician. Properly applied, along with his training and ability, could lend itself immeasurably in moulding our future course."

Edwin F. Abels of Lawrence, Kansas, Past President of the National Editorial Association and Editor of The Lawrence Outlook, addressed the gathering on how "An Editor Views Medicine". Pointing out that the local small press represents and speaks to the large majority of Americans from the home town, with the threat also leveled at the public free press, expressed the sincerity of the local publishers in welcoming the example set by the great American Medical Association in speaking the truth and endeavoring to arouse public apathy to the dangers which lie ahead in the blind pursuit of a socialized economy.

The Most Reverend John J. Wright, D.D., PhD., Roman Catholic Bishop of the Diocese of Worcester, Massachusetts, delivered a stirring address on how "A Clergyman Views Medicine". The peoples of the World must first become morally right, honest and speak the simple truths before there will be hope for peace to come, he stated. Man has so completely discarded these basic virtues that there is little wonder chaos is so rampant today and the future so dismal, replete in distrust, discontentment and loss of faith.

Honorable Richard M. Nixon, of Whittier, California, United States Senator from the State of California, set forth his opinion on how "A Legislator views Medicine". Recognizing that the medical profession represents the highest level of education in our Country, he expressed

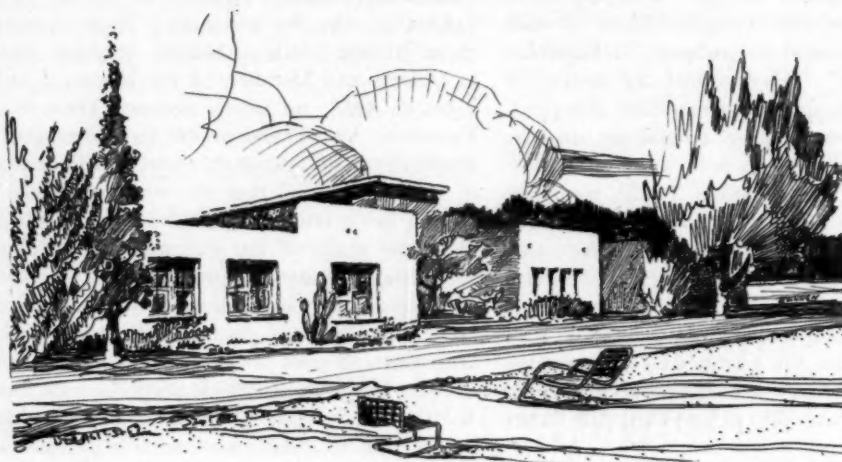
the belief that the physician should give freely of his wisdom to guide legislators on all national issues. He told the doctors that they owe it to themselves and to the Nation to stay in politics.

Monday evening, June eleventh, at Hotel Traymore, was the scene of a dinner-meeting given by the Medical Society of New Jersey to Officers and Members of the House of Delegates of AMA, on which occasion Dave Beck, Executive Vice-President of the International Brotherhood of Teamsters, American Federation of Labor, declared that the road to final solution to bring adequate medical care within the economic grasp of our citizens is not through socializing the medical profession. The answer as proposed by advocates of Government-controlled medicine is contrary to our economic structure and goes beyond our traditional guarantees. Any system which proposes such modifications in our way of living and doing things would lead to a dangerous socialistic trend and cannot be tolerated. Such a system would destroy our liberty. To the medical profession, he continued: "You have earned the respect of your fellow country-men over and over through the work you have done on Main Street, in our great cities, on the battlefield, in our hospitals and in the classrooms. The answer lies in Voluntary medical programs—prepaid medical plans. This system of Voluntary health care is making a great record in this Country. Let us continue the Voluntary way of doing things in America—it is our best protection against any compulsory way. It is compulsion and interference with our individual freedom and initiative which lead to State control—dictatorship, Fascism, Communism. We will not permit any of these to take root in the profession of medicine."

Introduced by Louis H. Bauer, M.D., Chairman of the Board of Trustees and President-elect of the American Medical Association, on Tuesday evening in the Ball Room of Atlantic City Auditorium, John W. Cline, President of AMA, declared that: "No health crisis or medical emergency exists in this Country" and warned that the real danger lies in the double threat of war abroad and loss of freedom at home. In his inaugural address, broadcast nationwide during ceremonies at the 100th annual session of AMA, he expressed "deep and abiding faith in the intelligence and integrity of the American people," adding that "they will respond as they did when their medical welfare and their medi-

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cal freedom were threatened." Calling for constant vigilance, American doctors will continue to "oppose socialistic schemes which would jeopardize the freedom of any segment of our society." "American medicine could not have attained its present position without the assistance and cooperation of our educational institutions, our scientists, our colleagues in public health, our hospitals, nurses, dentists, labor and management, and all the American people—working with initiative and independence toward the same goal. Together we have made great progress in the fight against death and disease, until today we are the healthiest large nation in the world.

Dr. David B. Allman of Atlantic City was selected to fill out Dr. Bauer's unexpired term (1954) on the Board of Trustees and Dr. Walter B. Martin of Norfolk, Virginia, was reelected to a five-year term on the Board.

Dr. Oscar B. Hunter of Washington, D. C., was unanimously chosen AMA vice-president.

Other officers re-elected were: Dr. George F. Lull, Chicago, secretary; Dr. J. J. Moore, Chicago, treasurer; Dr. F. F. Borzell, Philadelphia, speaker of the House of Delegates; and Dr. James R. Reuling, Bayside, N. Y., vice-speaker.

The AMA Coordinating Committee, in charge of the National Education Campaign since its inception in January, 1949, will continue to function, again headed by Dr. Elmer L. Henderson, Louisville, Ky., retiring president of AMA. The Board of Trustees announced that the public relations firm of Whitaker and Baxter would be retained for another year.

At the close of registration Thursday, June fourteenth, 11,987 physicians had registered for the 100th Annual Session of AMA. Among the membership from Arizona were registered: Drs. Charles L. von Pohle, Chandler; V. E. Frazier, Mesa; Joseph Bank, Frederick W. Coleman, George S. Enfield, Robert S. Flinn, Jesse D. Hamer (Delegate), Charles Kalil, Phil H. Lovelless, H. J. McKeown, Wallace M. Meyer, Robert A. Price, Maurice R. Richter and James M. Whitelaw, all of Phoenix; and Benson Bloom, O. J. Farness, Walter T. Hileman, Donald F. Hill, W. Paul Holbrook, Arnold L. Lieberman, Teresa McGovern, Joy Alba Omer, Raymond F. Oyler, Jackman Pyre, John J. Rupp, Delbert L. Secrist, Henry J. Stanford, Alden B. Thompson, Hugh C. Thompson, William Kirby West, and Marguerite S. Williams, all of Tucson.

PHOENIX CLINICAL CLUB MASSACHUSETTS GENERAL M. G. H. CASE NO. 29341

The Case History in this discussion is selected from the Case Records of the Massachusetts General Hospital, and reprinted from the New England Journal of Medicine. The discussant under Differential Diagnosis is a member of the staff of the Massachusetts General Hospital. The other discussants are members of the Phoenix Clinical Club.

A thirty-six-year-old white bank clerk entered the hospital because of increasing dyspnea of three months duration.

The patient had had a long history of respiratory distress. Nineteen years prior to admission, while in college, he had had two attacks of pneumonia within a few months. Tuberculosis was suspected but chest plates failed to confirm the diagnosis. For the next ten or twelve years he was well except for more than the usual number of colds. Seven years before entry he was examined for life insurance; in view of his past history an x-ray film of the chest was taken which showed a lung tumor. He was admitted to an outside hospital where, following artificial pneumothorax, an exploratory thoracotomy was performed. A diagnosis of inoperable malignant tumor of the lung was made. He recovered from the operation and returned to work, free of symptoms.

During the next two years he lost about three months every year from his work because of upper respiratory infections. He was given x-ray treatment every three months. Two years later, that is, three years prior to admission, he had pneumonia again. About one year prior to admission he was told by his physicians that they had considered his lung tumor malignant and incurable but that he had lived for so many years they had become convinced that the tumor was benign. For the next two or three months he developed episodes of palpitation which he believed were due to "nerves". These passed off and did not return. Three months prior to admission he had the grippe. Following this there was a gradual onset of dyspnea, which prevented him from walking up hill or climbing stairs. Three weeks before entry the dyspnea cleared up for a short time, but soon returned and became progressively worse. There was no history of tuberculosis.



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Physical examination showed a thin, pale man with a sallow complexion. There was some increased prominence of the veins of the forehead and neck. The left border of cardiac dullness was 16 cm. to the left of the midline in the seventh interspace. The heart was otherwise normal. The lungs showed dullness over the right apex, becoming flat at about the level of the fourth rib. The entire right lower lung was flat, with absent breath sounds and decreased fremitus. The left lung was resonant, but there were occasional rales at the base. The abdomen was negative except for a tender liver edge, which could be percussed 8 cm. below the costal margin.

The blood pressure was 110 systolic, 90 diastolic. The pulse rate was between 100 and 130, and the respiration between 20 and 25. The temperature was normal.

The hemoglobin was 11.3 gm per 100 c.c., and the white-cell count 13,600. A blood Hinton test was negative. Two sputum examinations were negative for tubercle bacilli.

An x-ray film of the chest showed complete obscuring of the lower two thirds of the right lung field by fluid. The right upper lung showed increased density with honeycombing. A grid film showed the right main bronchus visible for about 2 cm., beyond which it could not be made out. The left lung field was clear. The heart shadow was tremendous, and the configuration suggested pericardial effusion. Fluoroscopically no pulsation was demonstrable. The mediastinum was not displaced. Repeated x-ray examinations revealed no additional findings. A chest tap in the eighth space in the subscapular region yielded 30 c.c. of light-amber fluid, followed by 220 c.c. of what appeared to be whole blood. This was removed from several directions and depths. A repeat tap in the seventh space in the midaxilla again yielded 30 c.c. of blood. No tumor cells were seen in the fluid, which contained innumerable red cells. Two days later the venous pressure was recorded at 330 mm. of water (normal control, 137 mm.) The patient was refluoroscoped at that time. A definite pulsation of the heart could be seen. No change in the contour of the heart could be demonstrated on changing the position of the patient from erect to horizontal. The left border of the heart shadow was convex and without any break in the smooth curve to indicate the limits of the pulmonary conus and left ventricle. Lam-

inography showed the right main bronchus to end sharply 2 cm. from its bifurcation. No air could be seen entering the lower and middle lobes. There was narrowing of the upper bronchus extending into the areated portion of the lung. Several small air-filled areas were seen in the region of the lower lobe. A dense soft-tissue mass was seen lying between these and the blocked right main bronchus. The outline of the mass could not be clearly defined. An electrocardiogram was interpreted as showing sinus tachycardia, with a rate of 120, slight right-axis deviation, low T_1 , total inversion of CF_2 and a very low T in CF_4 and CF_5 .

The patient's dyspnea increased progressively. He died on the twelfth hospital day.

DR. W. W. WATKINS

The first impression left after reading over this case record is that Judge Woodman has missed the calling for which he seems to have a peculiar genius,—namely that of thimble-rigger at a county fair. If he could have in front of him three little shells or thimbles and a small rubber ball, usually called a "pea", and should deftly manipulate these and then offer to bet the yokel, now portrayed by me, that he cannot tell under which shell or thimble the "pea" is located, the situation would exactly simulate that in which we now find ourselves. The "pea" is the diagnosis, the three shells or thimbles are (1) benign lung tumor, (2) malignant lung tumor, and (3) inflammatory lesion. The thimble-rigging or three shell game is represented by what we are told about this lesion, which was diagnosed, undiagnosed, misdiagnosed, and finally wound up by killing the patient.

While getting Dr. Woodman's vocational aptitudes correctly diagnosed, I would like to pause a moment and turn the heavy artillery on the physician who undiagnosed the case because the patient persisted in living. This patient had been given treatment by a hard-working radiologist, who irradiated the lung lesion every three months over a period of two years. Yet this physician, with a scurrilous skepticism about the efficacy of x-ray treatments, would change his own diagnosis before he would give the radiologist credit for slowing down the progress of this inoperable malignancy.

But let's get back to the hopeless task of guessing under which shell the "pea" is hidden, with the odds well in favor of Dr. Woodman's

having palmed it and each thimble or shell being empty.

The whole question would seem to hinge on whether the chest surgeon who opened this chest seven years back was wrong in his diagnosis of an inoperable malignant lesion, when he looked in and probably palpated the tissues. A lung tumor had been shown by x-ray so we will consider the possibility of the "pea" being under the thimble of BENIGN TUMOR, misdiagnosed by the surgeon at the time of the thoractomy, as being malignant and inoperable. We are not told whether this conclusion was based on the appearance or feel of the tumor, or on tissue examination. It should have been based on all three, but it would be misfeasance, malfeasance and nonfeasance for a judge to withhold a tissue report, if such examination was made. So, we assume none was made, and assign these grave offenses to the surgeon, rather than the judge. The appearance and feel of a lung lesion cannot be accepted as conclusive in making a diagnosis of the nature of a lung tumor or other lung lesion. The pathologist must decide the question. The benign adenoma can be associated with atelectasis and inflammatory reaction which might closely simulate an infiltrating malignancy. We know this patient did have recurrent lung infections, so we would expect extensive fibrotic changes in the lung tissues very deceptive to palpation. This man was only 29 years of age when the tumor was discovered; this is a little young for lung cancer because he has not yet had time to subject his bronchi and lung tissue to the necessary 20 to 25 years exposure to cigarette smoke and its carcinogenic phenanthrenes. Finally, we would not trust the surgical judgment of a chest surgeon who would nonchalantly make a diagnosis of inoperable cancer of the lungs in a 29 year

Well, how about the CANCER thimble? Maybe claim the "pea" should be under the benign tumor thimble. We lift the shell and the "pea" is not there!

Well,—how about the cancer thimble? Maybe the chest surgeon was right the first time, until the radiologist misled him by keeping the patient alive too long. In the terminal stages the lesion does take on the aspects of an extending malignancy. We now have more x-ray findings than we know what to do with,—yet we could use more. There is pleural fluid; there is pericardial fluid; a visible mass of soft tissue density is in

right lower thorax, and this appears to be obstructing the main right bronchus. Even with a blocked bronchus there was no mediastinal shift, which would seem to exclude gross atelectasis, and indicate that the right side density is fluid, consolidation, or tumor or a combination of these. We could stand to know whether the soft tissue mass found in the later stages was at the same locality as the tumor shadow shown seven years back. We do not know this, and since the point is a vital one and must have been known to the observers of this patient, and, therefore, should be available to us, we can only conclude that withholding this information is a part of the legerdemain of thimble-rigging. If we want to bet on malignancy, we have quite a little support. A lung tumor demonstrated by x-ray, after a long history of recurrent lung infections. A thoracotomy confirmed the tumor, interpreted as a malignant one and inoperable. In further support, the following quotation is offered, from an article by Dotter, Steinberg and Holman, in the Amer. Jour. of Roent., of August, 1950: "Exploratory thoracotomy is now proved to be a safe and satisfactory method for establishing *with certainly* the nature and extent of pulmonary neoplasms." It is true these writers anticipate that tissue will be obtained and the certainty of the diagnosis will be furnished by the pathologist,—a link which is missing in our case. It is also true that this patient's obstinacy in living too long made the physician change his mind about the character of the lesion. But we have already suggested that this vacillation in diagnosis was based on an incredible and scurrilous absence of faith in the efficacy of the x-ray treatments, which this man seems to have had in abundance. So, we indicate the thimble of MALIGNANT TUMOR. We lift the thimble, and what do we see? You are right,—no "pea!"

Thimble-rigger Woodman says we can still win, if we locate the "pea" under the third shell, and give it a name.

Was the original tumor benign and all subsequent developments due to infections one after the other, with these infections finally involving the pleura, pericardium and heart to a fatal degree?

Was the tumor benign and did the repeated x-ray treatments induce a radiation fibrosis and subsequent infection? We know nothing about the amount of radiation given, but if it was aimed

at slowing down a malignant process, which must have been the case since this was the diagnosis at that time, the patient must have received from 1000 r to 2500 r every three months for two years, as stated. This could build up to quite a tissue dose.

Was the tumor benign in the outset, with a malignant metamorphosis in the later stages? Adenomas of the lung are capable of doing this, and the main reason for removing them whenever discovered and diagnosed, is to avoid this development.

Was the original tumor a benign one and did a second tumor of malignant type develop *de novo* in the same lung? Such cases are recorded, and this is just about the sort of stunt our jocular judges would pull on us.

Was the original lesion and all subsequent developments due to infection,—without any tumor at all? That would be too much. We are approaching the Christmas season, when good will, brotherly love and other Christian virtues should prevail, and I do not think our judges, who have shown an almost unimaginable capacity for dishing out punishment,—would sink so low as this,—at Christmas.

Having buttressed myself with an alibi in every imaginable direction, I am now prepared to lift the third shell,—and to find the "pea" not there, but secreted in thimble-rigger Woodman's palm—the logical and ethical technic whenever any respectable practitioner of thimble-rigging deals with a susceptible yokel. I am betting in this order of probability:—

Shell No. 1. Bronchogenic carcinoma, whose progress was slowed up by radiotherapy, but which eventually spread into a fatal dissemination.

Shell No. 2. Original tumor benign, but with a malignant metamorphosis in the later stages.

Shell No. 3. Original tumor benign, with a super-added separate malignant growth.

4. The "pea" in Woodman's palm. Benign tumor, with tissue changes and all subsequent developments due to infection.

DIFFERENTIAL DIAGNOSIS

Dr. C. Sidney Burwell*: I should like to try to reconstruct some stages of this gentleman's course, beginning at the time he came into the hospital, to see what specific statements we can make that seem reasonably acceptable concern-

ing the anatomic and functional situation of the heart and lungs.

In the first place it seems to me demonstrable that this man had an interference with the entry of blood into his heart—that he had pericardial tamponade. This conclusion is based on the following observations. He had distended neck veins and elevated venous pressure; there is no mention of the development of collateral circulation from either the superior or inferior caval areas. We do not have a measurement of the venous pressure on the femoral vein, but there was evidence on physical examination that the liver was greatly enlarged and tender. I should accept that as evidence that he had an elevated pressure in his whole venous system. To that should be added the observation on his pulse pressure, which was very low,—only 20 mm.,—with a low systolic and a high diastolic pressure. No statement is made about the presence or absence of paradoxical quality. The patient had an extremely rapid heart rate without fever, again a characteristic finding in those who suffer from obstruction of the entry of blood into the right side of the heart. This conviction of the presence of cardiac tamponade is strengthened by the observations that seem to indicate that he had a pericardial effusion of considerable size—namely, a very large heart shadow and what could be described as an "expressionless" heart, which neither moved nor exhibited the landmarks on the contour which we are accustomed to recognize. Thus he had a large, nonpulsating, smooth, heart shadow, combined with evidence of obstruction to the entry of blood into the heart, and I think we can say that he had pericardial effusion, with obstruction to the flow of blood from the venous system into the heart.

Now let us turn our attention to the pulmonary situation at the time he came into the hospital. That also seems to me to be impressive from the point of view of its mechanics rather than from the point of view of information concerning its etiology. The patient had, quite clearly, a long history of progressive obstruction to the bronchi of the right lung. I surmise that the course of events was an obstruction to one or the other branch of the right bronchus, leading to atelectasis beyond the point of obstruction and to the development of bronchiectatic cavitation, probably recurrent infections in the atelectatic lung, destruction of lung tissue

*Research professor of clinical medicine and Dean, Harvard Medical School.

and the leaving of this honey-combed structure as the late result of bronchial obstruction. It seems to me that that meets the situation better than the possibility—the remote possibility it seems to me—of congenital polycystic disease of the lung. This man, I should say, had had a series of collapses of the middle and right lower lobes, ending up in the situation in which he entered the Hospital. More recently he had probably had beginning obstruction of the upper branch of the right main bronchus, with a similar change in the right upper lobe. This I should place pericardial effusion and pericardial tamponade as the first part of our diagnosis, and bronchial obstruction with atelectasis and bronchiectasis as the second.

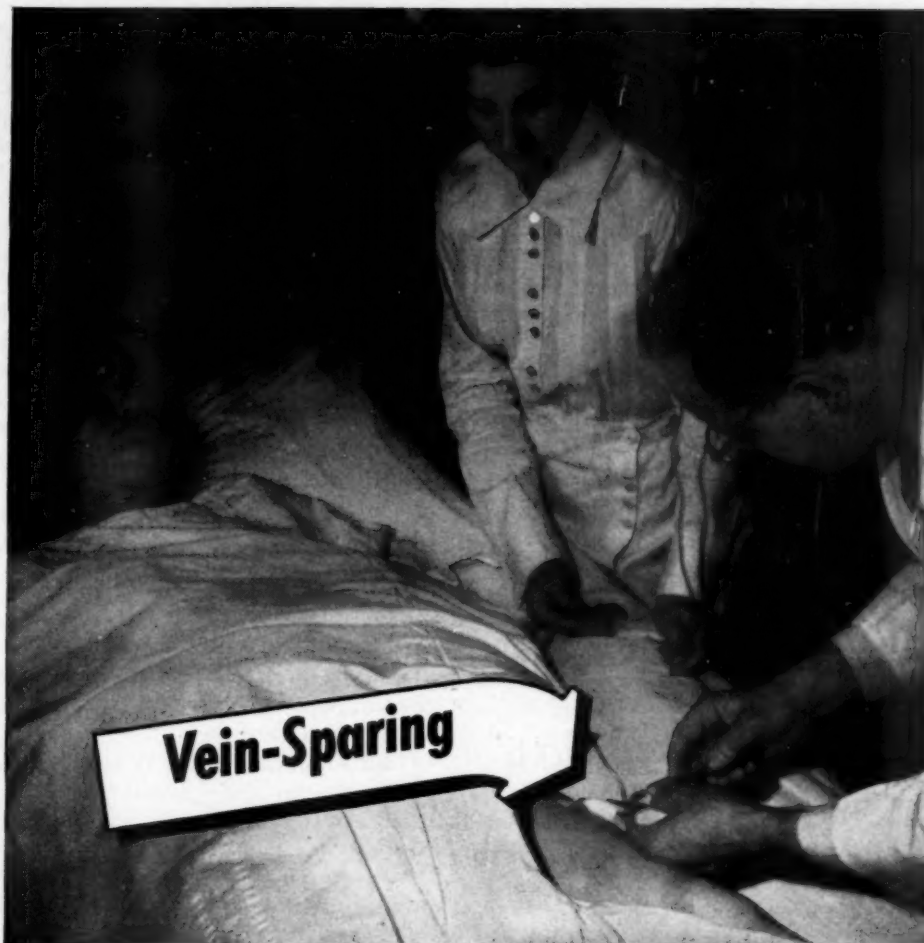
Then we come to the most important and difficult part of the discussion—the basis for these mechanical changes in the lung and heart. Are they to be placed fundamentally on an inflammatory disease or on a neoplastic basis? Let us consider the possibility of a unitarian basis—that everything can be explained by one etiologic factor. What about tuberculosis? We know that tuberculosis of the bronchi is commoner than we thought; that enlarged lymph nodes in the mediastinum or the hilus of the lung may invade the bronchi and lead to inflammatory stricture and to obstruction. Let us consider the possibility that he had reactivation of the mediastinal nodes and invasion of the pericardium by tuberculosis. It seems to me there are at least three very important pieces of evidence against the hypothesis that it had been or was tuberculosis, particularly the latter. One is the fact that he was quite free of fever, and I take it that the observation of a normal temperature was not a single isolated reading at a moment after a cold bath or something of that sort, but did really reflect the situation while he was in the hospital. I see from the chart that he never had fever over 101°F. and that it was usually around 99. That seems to me strong evidence, not final, against an active pericardial tuberculosis. The second piece of evidence against the possibility of tuberculous pericarditis is the presence of blood in the fluid that was removed presumably from the pleural cavity. It may have been removed from some other cavity in relation to the right lung since the first tap conceivably might have been into the pericardium; but wherever it came from the fluid was so bloody that it was less characteristic

of a tuberculous lesion than of a neoplasm involving either the pleura or the pericardium, or both. There is particular case for the position, so far as I can find out, that a primarily tuberculous lesion may undergo malignant degeneration and be the site of tumor. Another important argument against the presence of tuberculosis is the observation seven years before entry, when his chest was opened and the surgeon, who had the inestimable advantage of a direct view, saw something he believed to be an inoperable malignant tumor of the lung. It is conceivable that that was on a tuberculous basis, but I think that it is much likelier to have been a neoplasm.

If we set aside tuberculosis, we are then confronted with the necessity of postulating a neoplasm. This certainly the commonest cause of bronchial obstruction. Assuming it was a tumor, it had the extraordinary dual capacity of existing at least seven years—possibly more—and at the same time having done something recently that sounds very much like malignant invasion of neighboring structures. We must consider various types of benign tumors that obstruct the bronchus—the adenomas and various other ones, —some of which may undergo malignant degeneration after years of growing. We must consider lymphoma. It does not appear in the record whether or not the x-ray treatment, which was faithfully administered, had any effect. However, if it had had an effect, we probably should have been so informed. I am trying to interpret that evidence, such as it is, as indicating that it was not the type of specific improvement after x-ray that we should expect if we were dealing with a lymphoma.

There is a curious silence about the state of this man's cough and sputum. I think one must interpret that as indicating that cough and sputum were not remarkable, and I derive from that the suggestion that hemoptysis was not a vigorously presenting symptom.

So we have quite an assignment—a neoplasm that obstructed the bronchus but did not produce much cough, did not produce large amounts of sputum, did not lead to hemoptysis and had lasted all these years, to explode in an extension to the pleural and pericardial cavities. At the time of the onset of his disease, this man was twenty-nine years old, a situation that further narrows the probabilities regarding the nature of the hypothetical neoplastic process. I do not



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RESEARCH IN THE SERVICE OF MEDICINE **SEARLE**

WHEN WRITING ADVERTISERS PLEASE MENTION THIS JOURNAL

think, by the way, that he had an aneurysm. There is no suggestion in his history or in the serologic findings. The patient was too youthful to have had an aneurysm that lasted as long as this, and I do not believe that the blood that came out at the time the chest tap was done was due to the entrance of the needle into an aneurysm.

If we ask ourselves what are the types of neoplasm that might fulfill this order, we certainly should have to consider carefully the small group of tumors arising from the mediastinum—the dermoid cyst, the teratoid tumor and so on. These do occur in men of this age. Most of them make themselves known before thirty or forty. Most of them have announced themselves, if they are going to grow, by the time the patient is forty. They almost always start in the anterior mediastinum and are more apt to go to the right than to the left. They are known to compress and occlude the right main bronchus or its main branches, and they may secondarily undergo late in their development the type of malignant change that it seems to me is suggested by the recent developments in this man's history. But, unhappily for me, he never spit up any hair or teeth or had any of the other charming observations that serve to make a positive identification of such a tumor. However, it seems to me that that group—probably a dermoid cyst with malignant change—fits the bill better than any other type of tumor I can think of.

The commonest tumor, of course, to give this kind of termination is bronchiogenic carcinoma. Bronchiogenic carcinoma with an onset at twenty is not impossible, but one that lasts for seven years is certainly an extreme rarity. According to what statistics I could put my fingers on, the great majority of people with bronchiogenic carcinoma do not live for more than five years. In fact the longest duration that I could find in recorded cases of bronchiogenic carcinoma was between five and six years.

There is one other point. This man had had attacks of palpitation. Whether these were because he was nervous, or because he was anemic, or whether these attacks were associated with paroxysms of tachycardia or fibrillation I do not know. Such paroxysms occur frequently in people with pulmonary or mediastinal carcinoma, or with actual invasion of the pericardium by carcinoma, and the record does

suggest that these attacks may have been brought on by such a mechanism.

I shall conclude by saying that I believe this man had a pericardial effusion, pleural effusion and bronchial obstruction with atelectasis, and that this was based on an extramural neoplasm that eventually involved the walls of the bronchi. This tumor was originally benign but eventually underwent malignant change and extended to the pericardium. Of all types of neoplasm, I consider a dermoid cyst to be the likeliest origin.

When one thinks of pericardial obstruction or distention in a case of neoplasm, one has to consider the possibility that it is due not to fluid but to actual invasion of the pericardial cavity by solid tumor. I know only two ways to make the diagnosis: to find cells in the pericardial fluid, which is comforting, or to see a shadow of the pericardium that is not smooth but lumpy. That may be inflammatory, of course, but is likely to be tumor.

Dr. Benjamin Castleman: Dr. Sweet, you said that the pericardium was tapped. Is that correct?

Dr. Richard H. Sweet: Yes. The reason it is not in the record is that I did it myself and forgot to write it down.

I did a pericardial tap through the paraxiphoid region first and obtained fluid readily. But it looked to me to be whole blood, and after drawing off a few hundred cubic centimeters, I withdrew the needle because I did not want to bleed the man to death. At the suggestion of Dr. Conger Williams, who saw this man with me, I then inserted the needle laterally to the first tap and the same kind of fluid was obtained; I could feel the pulsation of the heart muscle with the needle. We were sure that he had a massive effusion. Since the fluid was so much like whole blood and since the patient had a red-cell count of 2,500,000, I desisted. At a later chest tap we also removed whole blood.

Dr. Burwell: If it was fluid blood, and I think it must have been, that strengthens the case for rapidly growing neoplastic invasion. The presence of blood in the pericardium is due either to trauma, to cardiac rupture or to neoplasm. The inflammatory fluid from tuberculosis may contain red cells, but it is not usually grossly bloody.

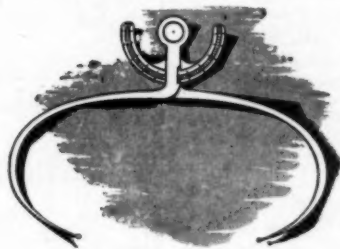
What about his sputum?

Dr. Sweet: The patient never had any

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hemoptysis. He had a lot of cough and Dr. Burwell was correct in his interpretation of the bouts of what the doctors called variously grippe, pneumonia or what not, which must have been due to bronchial obstruction. After the patient died I obtained a report from the surgeon who operated on him seven years previously. He was convinced that the pulmonary tumor was a carcinoma.

Dr. Burwell: Not a shriveled-up lobe?

Dr. Sweet: No; he saw a large round mass.

Dr. Burwell: It was within the right lung?

Dr. Sweet: Yes, in the region of the middle lobe. Unfortunately no biopsy specimen was taken.

I never entertained any thought of operating on the patient, but tried to establish a diagnosis. My conclusion was that he had a teratoma.

Dr. Burwell: No teeth could be seen in any of the x-ray films.

Dr. Sweet: No; however, I do not mean a dermoid cyst. A teratoma behaves differently from most of the dermoid cysts in the mediastinum that I have seen.

Dr. Castleman: I am sorry that Dr. Conger Williams is not here, but I shall read his note:

I am in favor of the diagnosis of pericardial effusion with tamponade to explain the findings of high venous pressure, paradoxical pulse and large cardiac shadow without evidence of valvular disease or anything to suggest diffuse myocardial involvement. Additional suggestive findings are left-border dullness 2cm. outside the apparent apex impulse and narrowing of the border of superior cardiac dullness on the left in the sitting position in comparison with the lying position. There is probably some displacement of the heart shadow to the left, but it does not account for the large cardiac shadow. The blood pressure of 108/78 is not especially impressive, but does not exclude the diagnosis. The fact that the heart sounds come through well does not rule out pericardial effusion. Also in favor of pericardial effusion, as against heart failure, is the fact that the patient can lie flat on his right side without dyspnea.

CLINICAL DIAGNOSIS

Teratoma of mediastinum, with extension to right bronchus and pericardium.

Pericardial effusion, with cardiac tamponade.

DR. BURWELL'S DIAGNOSIS

Malignant dermoid cyst of mediastinum, with extension to right bronchus and pericardium.

Pericardial effusion, with cardiac tamponade.

Pulmonary atelectasis and bronchiectasis.

Pleural effusion.

ANATOMICAL DIAGNOSIS

Carcinoma of the lung, with extension to pericardium, right auricle and pulmonary vein and partial obstruction to superior vena cava.

Pericarditis, acute and chronic, with hemorrhagic effusion.

Cardiac tamponade.

Pulmonary atelectasis, with cholesterosis, right middle lobe.

Hydrohemothorax, slight, right.

Pleuritis, chronic, fibrous, right.

PATHOLOGICAL DISCUSSION

Dr. Castleman: There was only about 100 c.c. of hemorrhagic fluid in the right pleural cavity, but most of the cavity was obliterated by dense fibrous adhesions. Most of the right lung was replaced by a grayish-white granular, soft tumor with many areas of necrosis, one of which formed a cavity measuring about 3 cm. in diameter in the lower lobe. The tumor involved the entire lower lobe and the lower four fifths of the upper lobe. The middle lobe was entirely collapsed and fibrotic and was mottled yellowish orange, owing to the large deposits of cholesterol. This so-called "cholesterosis" of the lung is not uncommon with long-standing bronchial obstruction. The middle and lower lobe bronchi were filled with tumor nodules. This tumor had extended medially to involve the right side of the pericardium, and the pericardial cavity contained a liter of bloody fluid. The visceral pericardium was covered with a shaggy brownish-red fibrinous exudate. The tumor apparently had extended through the wall of the parietal pericardium and had bled into the pericardial cavity. There was no actual tumor on the visceral layer, so that all this blood in the pericardial cavity was due to oozing from the tumor that had penetrated through the parietal layer. It had also penetrated through the right auricular wall into the auricle, obliterating a large part of its cavity, blocking the orifice of the superior vena cava, but without involving the endocardium. The tumor had also extended from the lung into the lower pulmonary vein for a distance of 4 cm. and had almost reached the left auricle. A photomicrograph taken through the right auricular wall shows tumor cells replacing the myocardial fibers. The tumor cells are epithelial in character. There is no stroma

between the cells, and without knowing anything about the story I am sure every pathologist would call this straight forward carcinoma of the lung. With the information that the tumor was of at least seven years' duration one might be justifiably skeptical of a diagnosis of carcinoma and might then bring up the diagnosis of endothelioma, possibly arising from the pleura.

Dr. Burwell: That would account for the extraordinary bleeding.

Dr. Castleman: Most of the tumors of the pleura diagnosed as endothelioma are carcinomas of the lung with extension to the pleura. In fact we rarely if ever make the diagnosis of endothelioma. The cases that have been reported as endothelioma usually have nodules all over the pleura and are associated with a hemorrhagic effusion. There were no nodules on the pleura in this case. Another theory of the origin of this tumor is that it arose from a bronchial adenoma. The right bronchi were filled with tumor, which may have been benign years ago and then became malignant, as a few of them do. We know that adenomas are prone to extend through the bronchial wall and form large extrabronchial tumors. Perhaps the tumor felt seven years ago may have been an adenoma. If that were true, it is strange that the patient had no hemoptysis.

Dr. Burwell: That is what troubles me.

Dr. Castleman: Nevertheless, I think we have to make a positive diagnosis at autopsy of carcinoma of the lung with extension into the pericardial cavity and into the heart. There was a metastasis to an intrapulmonary lymph node, close to the tumor, but no distant metastases.

Dr. J. H. Means: Would you grade it as a slowly growing malignant tumor because it has

been there for seven years? It must have been growing slowly.

Dr. Castleman: It was not rapidly growing, but certainly not slowly growing.

Dr. Burwell: Is that not an extraordinary duration?

Dr. Means: It does not seem possible that a carcinoma of the lung could have been present for seven years.

Dr. Castleman: I was also puzzled and showed these slides to two other pathologists, who agreed to the diagnosis of carcinoma.

Dr. Burwell: Suppose it had been an adenoma. Might it not have developed deep enough in the mucosa so that it went outward instead of inward?

Dr. Castleman: All the adenomas with extra-bronchial extension that we have seen also have a nodule of tumor protruding into the lumen, unless, of course, it had been removed bronchoscopically.

Dr. Burwell: It seems to me evident that whatever this was seven years ago, it was a carcinoma at autopsy. The problem that has to be settled is the presence of an obstructing lesion seven years previously that eventuated into a carcinoma of the lung.

Dr. Castleman: I believe that one can have a carcinoma of the lung of low-grade malignancy for seven years. A case that Dr. Allen discussed recently was a hepatoma of nine years' duration.* I think the whole idea of long-standing malignant tumors is something that we perhaps do not appreciate sufficiently.

Dr. Burwell: He had no hemoptysis.

Dr. Sweet: No; which suggests that the tumor did not arise in a large bronchus.

Dr. Burwell: That is one of the reasons why I thought of an extramural source.

Dr. Sweet: I was convinced all along, until I saw the autopsy, of mediastinal origin.

*Case records of the Massachusetts General Hospital (Case 29331). New Eng. J. Med. 229:342-345, 1943.

TOPICS OF CURRENT MEDICAL INTEREST

RX, DX, AND DRS.

By GUILLERMO OSLER, M.D.

The ODDEST TITLE of any book seen lately, medical or other wise, is by Dr. Reed Nesbit, noted urologist at the University of Michigan,—"Your Prostate Gland. Letters from a Surgeon to His Father" . . . In spite of the title it is a very fine book, one which you can well recommend to a patient confronted with a prostate lesion or a

need for prostatic surgery, and one which costs but two dollars. . . . The letters actually were written to the elder Nesbit, then collected and published—after he had had surgery.

Do you know the action of CITROVORUM FACTOR on aminopterin? Ten dollar medical words

but the meanings are interesting and could be important. . . . Aminopterin is one of the drugs which can inhibit the wild growth of blood cells (leukemia), but which may also destroy normal cells. . . . Citrovorum factor is a cousin of folic acid, discovered by Baumann and Sauberlich of the University of Wisconsin Ag. School, and named for a type of bacteria (*Leuconostoc citrovorum*) used in testing amino-acids. It may be obtained from liver extract. It is possible that folic acid must be converted to its cousin before animal cells can use it. The citrovorum factor contains a growth factor. . . . The answer to the first question is,—'The action of aminopterin is counteracted by the citrovorum factor'. It may be possible to give the new material to limit the effect of aminopterin in leukemia.

The COST OF HOSPITAL CONSTRUCTION is painful to consider, but a 500-bed clinical center at Bethesda, Maryland, hits an all-time high. Forty million dollars, or \$80,000 per bed! . . . Ten Thousand per bed was huge in 1950; \$20,000 per bed was high in 1948; but \$80,000 is high even for the gov'ment.

The Journal of Pediatrics contains the first large comparative series of antibiotics for PERTUSSIS. . . . Aureomycin, chloramphenicol, and terramycin are of equal value. They are not specific, but they reduce the duration of the whoop (or dangerous) stage by 60 per cent. Streptomycin was disappointing.

The Aero Medical Association has announced a 40-cent OXYGEN MASK for use in passenger traffic. It is made of white plastic and is disposable. . . . The proposed use is for rapid application in the rare cases when pressurization of the cabin is lost at high altitudes. Many of the patients would need help during the few minutes which would be required for the plane to lower to a safe level. . . . Strangely, the occurrence very seldom occurs, as was mentioned in an editorial on Air Travel in ARIZONA MEDICINE three years ago.

Preliminary reports on a therapy for MALE INFERTILITY comes from a good source—Dr. Carl G. Heller of the University of Oregon Medical School. He has been deep in this research field since before his internship in Wisconsin with Dr. Elmer Servinghaus. . . . He notes the need of therapy to improve fertility, since 2 of every ten young men have some deficiency in their sperm cells. . . . Sixty infertile men were treated for 6 weeks with 50 mg. of testosterone per day; 100 per cent favorable results followed. . . . A newer, quicker method has been found to be effective in 20 cases. The material is a pituitary gland hormone, called equine gonadotropin, and is obtained from the placenta of a horse. The restoration of sperm count seems to persist after treatment for as

long as 3 years. . . . Testosterone is applicable to more cases than the second method, which can be used only when the damage to sperm production is not too great.

THE AMERICAN DRUGGIST reports a poll of pharmacists on federal versus voluntary medical plans. Three fourths of those who replied favored the voluntary plan; only nine per cent favored the government-sponsored plan.

The use of high-energy, ELECTRONS to STERILIZE PACKAGED FOODS has had a great deal of publicity. The same method may be of value in medicine, since electron sterilization raises the temperature less than 5 degrees C. . . . BLOOD, ANTIBIOTICS, ADRENAL CORTICOIDS, etc., are eligible for trial by the method. It has been used on surgical sutures (in ampoules) on a conveyor belt. . . . A cathode-ray sterilizer is used. Various types of bacteria have been exposed to varying doses, and the effective exposures are becoming known. . . . The composition of the substances is not changed when the exposure is specifically arranged. . . . It also seems possible that tissue transplants can be sterilized before use—an exciting potential of the method. . . . Machlett Laboratories has worked on the project with Dr. John Trump of M.I.T.

Sic Transit Gloria—The names of physicians who are gone are too soon forgot. The ancient ones can be recalled by very few, and the recent ones are fading fast. . . . What is needed is A MEMORIAL which will meet the eye, year after year. . . . There are at least two approaches,—the hospitals might arrange for it, or the county medical societies could do it. Plaques would be the easiest, but the most ignored and silent method. . . . We favor having each county medical society choose a list of 6 to 12 names; then label a lecture each month, or every other month, with the name of a physician. Money must be spent anyway to pay expenses, and it would be a kind and thoughtful act to keep a memory fresh. . . . Tucson, e.g., could have a Victor Gore Lecture, a Samuel Watson Lecture, and events named for the late Drs. Patterson, Charles Wilson Mills, Davis, Kibler, and a half dozen others to be chosen by a committee of elder senators—while there is someone who remembers.

The fabulous record of Dr. Mathra Das, one of India's leading eye surgeons, is published by the Medical Society of New Jersey. Up to the first of January, 1946, Dr. Das had done 189,663 CATARACT OPERATIONS. His record for a single day was 707 extractions. . . . It would fatigue most people to shake hands with that number. . . . No data were given on the incidence of infection or on the end results.

The following note may be 'significant',—The

National Association of COLORED GRADUATE NURSES has disbanded. Founded in 1908, the Association believes that its promotional function is no longer necessary. . . . Negroes are integrated into the nursing profession in many hospitals, public health agencies, and the armed services. The tendency is increasing.

New estimates of the values of 'ANTABUSE' are gradually appearing. . . . Early reports were encouraging; succeeding reports showed its toxicity and limitations; and a new paper by Wexberg and colleagues in the Medical Annals of the District of Columbia show its adjunct value. . . . They deny that it produces a conditioned reflex. The illness caused by an Antabuse-Alcohol combination is regular and biochemical. . . . They use it as an adjunct to psychotherapy; in 20 patients the effect was good and there were no untoward results. They also quote another careful series from New York of 150 cases in which there were no ill effects.

The March 'Hospital Topics and Buyers' Guide' quotes Dr. R. G. Kesel on DENTAL CARIES CONTROL PROGRAMS. He ought to know, since he is the University of Illinois professor who helped invent ammoniated tooth-paste. . . . Dr. Kesel says that there never will be an effective program until something can be introduced into routine living which will not require thought, action, or denial. . . . He favors fluoridation as a practical method. In addition, sugar consumption should be moderated, tooth-brushing after meals should be diligent, sodium fluoride may be applied to the teeth, and perhaps ammoniated dentifrices may be helpful. (He suggests that the last-named is not yet well enough tested).

DRUG ALLERGY may show itself by spikes of fever, abdominal pain, and a dermatitis. . . . The symptoms of fever (malaise, fast pulse, anorexia, sweating, etc.) may add to a diagnostic confusion.

The huge chore which is involved in opening A NEW MEDICAL SCHOOL is nearly complete in Los Angeles. THE UCLA MEDICAL SCHOOL will open for the first class September 19, 1951. . . . Dean Stafford L. Warren has assembled a faculty, obtained space, and arranged the curriculum. The housing will be in temporary structures. The hospital facilities include the Harbor General (750 beds), the Sawtelle V.A. Facility (1,500 beds), and the Long Beach V.A. Facility (1,500 beds). . . . Dr. Warren has drawn heavily on

the University of Rochester, where he was once professor of radiology. He has 22 fulltime faculty members, 98 clinical appointees. . . . Dr. W. P. Longmire Jr. of Johns Hopkins is Surgical Chief, and Dr. John S. Lawrence of Rochester is Chief for Medicine. . . . A UCLA Medical Center is being built by 1953 at a cost of \$15,500,000.

The mechanism of action of ACTH and Cortisone on most of the SKIN DISORDERS which respond is still uncertain. According to present concepts there is no evidence of hormone deficiency. The theory has to be constructed so that an excess of hormone is required to produce favorable results. . . . It will be interesting to see how it turns out.

The displacement of DR. MAGNUSON from the V.A. chief medical directorship could open the service to the same flaws which are said to be present in English practice and hospitalization. . . . Dr. Magnuson says that he was fired. He says that it is part of someone's plan to run the V.A. by beaureaucracy. . . . Dr. Paul Hawley says that the department has lost its prop and "will fall into the gutter". . . . It is hoped that the Humphrey Committee will spell out the chief's duties so that the 'old' V.A. cannot return.

The syndrome of HYPERVENTILATION should be remembered, since the cause is not an obvious one and the symptoms do not point to overbreathing. . . . It includes headache, light-headedness, dizziness, constriction around the chest, dyspnea, palpitation, and numbness and tingling of the extremities. . . . Nervousness, tension, and anxiety are predisposing states.

Dr. Clarence Mills of Cincinnati, famed expert on climatology, tropical diseases, clean air, etc., has gone beyond the cigarette advertisements to clarify THE BIOLOGIC HAZARDS OF SMOKING. His article in The Ohio State Medical Journal turns on the red stop-light. . . . Acute and chronic nicotine poisoning are serious effects. They result from ganglionic cell poisoning, with a stimulative-irritative-paralytic effect. . . . The diseases in which tobacco smoking may be a factor include thrombo-angiitis obliterans, peptic ulcer, respiratory tract cancers, reproduction and lactation in women, and other respiratory diseases. The information probably won't change the public's habits, but it could help the physicians' attitude.



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Left to Right: Dr. Russel V. Lee, Palo Alto, Calif.; Dr. John M. Murray, Boston; Dr. Cortez F. Enloe, Manhasset, Long Island; General Armstrong; Dr. Herbert B. Wright, Cleveland; Dr. William P. Holbrook, Tucson, Ariz., and Dr. Elmer L. Henderson, Louisville.

AIR FORCE

Inspection Tour in Korea.—Maj. Gen. Harry G. Armstrong, Air Force surgeon general and Brig. Gen. Albert H. Schwichtenberg, chief, Civil and Military Inter-Relation Division, Office of the Secretary of Defense, have returned from an inspection of the Air Force medical facilities in the Far East. Other military personnel in the tour included directors and top level chiefs of the Surgeon General and representatives of the School of Aviation Medicine.

Civilian consultants making the trip were Dr. Cortez F. Enloe, Manhasset, L. I., N. Y., internal medicine; Dr. Elmer L. Henderson, Louisville, surgeon and President, American Medical Association; Dr. William P. Holbrook, Tucson, Ariz., internist and president, American Rheumatism Association; Dr. Russel V. Lee, Palo Alto, Calif., internal medicine; Dr. John M. Murray, Boston, psychiatrist, and Dr. Herbert B. Wright, Cleveland, urologist.

A headquarters press conference was called April 5 by General Armstrong. Dr. Holbrook said, "We visited dispensaries, hospitals, airstrips, talked to pilots of fighters and bombers; followed the medical chain of evacuation from the front on back through the chain, and talked to hundreds among the group who were then well and doing the fighting. At present the three services—Army, Navy, Air Force—are giving the best care that has ever been given to the troops, with less than half the doctors per thousand troop population used during the last war."

Dr. Henderson flew 80 miles over the enemy

lines in Korea and rode an air evacuation plane carrying patients from Korea back to Japan. "Their morale," he said "was very high." A lieutenant remarked, "Five minutes after I was wounded I was back in the first-aid station where I was taken care of. My wounds were dressed, and within 50 minutes I was on a plane being evacuated by air to a hospital in Korea." Air evacuation is the greatest thing that has come out of this Korean incident as concerns saving lives of soldiers.

Dr. Enloe said, "I ran into five soldier-patients at Travis Air Force Hospital in California on March 17. On March 7 they had been wounded prisoners of the Chinese. They were released by our advance on the seventh and within 10 days were in California."

Dr. Lee checked particularly on young military doctors "I think I found only one out of something over a hundred physicians who was dissatisfied with his particular assignment," he reported. "I thought we would get a lot of complaints from these young doctors, but the contrary was true. They were all happy and glad to be doing their job. In other words, the medical morale was extraordinarily high."

According to the physicians who made the tour, as of March 31 a total of 112,000 United Nations personnel have been airlifted in the Korean action with not one injury or death occurring due to air evacuation. This figure included all UN casualties, also persons lifted several times, as well as persons hurt from causes other than battle injuries. Twenty-two thousand American casualties have been airlifted from the Pacific back to the United States.

DR. NELSON D. BRAYTON

Miami, Arizona

(Response to the Address of Welcome at the 60th Meeting of the Association at Tucson, Arizona. Member of the 50 Year Club of the Arizona Medical Association.)

Mr. President, Members of the Medical Association, Members of the Pima County Medical Society, Friends:

There is an old saying that Truth in Medicine is like the Venus de Milo of the Louvre in Paris — She wears no clothes.

So, in this great, though still young city; yet by nomenclature called the OLD PUEBLO, we again accept your welcome, and the always pleasant invitation for our scientific, cultural, educational, and social meeting—this one the 60th in the annals of our association.

A moment ago I said that Truth wears no garments; she needs no dressing up. Like Science, she recognizes no boundaries, she knows no Frontiers. In education the sky is her limit. And of Old Tucson we know that we can say hospitality is just as uncovered; just as limitless; just as boundless. Especially do we appreciate the hospitalities already shown and being shown

by your gracious ladies to our own ladies. In the same way we appreciate, and we accept, of the advances—your local advances—in engineering, in the arts, in education, and especially in the architecture of the human soul which is the ever expressive and constant natural growth of Tucson's own fine citizenship.

And in return for this fine compliment of our fine hospitality and to this welcome from our heart, the Arizona Medical Association pledges itself to the further solutions of the problems of Public Health and your Health; to the problems of personal illness, injury and disease; to the problems of Scientific, Therapeutic, and Pharmacologic advances of the future; to those great problems in the study of Human Relations and the Personal Dignity of Man; and to the Recognition, without appreciation of the PRESS in presenting, in its fairminded way, our problems to the Public.

Especially in this meeting do we again dedicate ourselves to the sanctities of the problems of the POOR. In our endeavors to worthily compliment your hospitalities and your Welcome, I SAY TO YOU "THE ARIZONA MEDICAL ASSOCIATION WILL NOT FAIL."

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R. Lee Foster, M.D., Director

John W. Kennedy, M.D., Radiologist

W. W. Watkins, M.D., Consultant Radiologist

Diplomates of American Board of Radiology

SCHERING AWARD WINNERS ANNOUNCED

Dr. S. I. Griboff, senior medical student at Syracuse University College of Medicine when he enrolled in the competition, has been announced as the winner of the "Schering Award for 1950." Dr. Griboff is now serving his internship at Mt. Sinai Hospital, New York City. Mr. Francis C. Brown, president of Schering Corporation, presented the first prize of \$1000 to Dr. Griboff for his paper on "The Clinical Use of Steroid Hormones in Cancer."

Co-authors Robert W. Winters and Henry M. Williams, both third year students at Yale University School of Medicine, were tied with Kenneth J. Ryan, third year student at the Harvard Medical School, for second prize and were awarded duplicate prizes of \$500. Monte J. Meldman, third year student at Marquette University School of Medicine, was awarded the third prize of \$300. Twenty-five contestants received honorable mention, and each received special awards in acknowledgment of their contributions.

The Schering Award is given annually for the best manuscripts prepared on designated phases of endocrinology. Medical students of the United States and Canada are eligible for the contest. The majority of medical schools are represented by applicants.

Each year three physicians prominent in the clinical field covered by the subject act as judges for the Schering Award Competition. The judges for the 1950 Award were Dr. Ira T. Nathanson, Assistant Professor of Surgery, Harvard Medical School; Dr. Cornelius P. Rhoads, Director of the Memorial Center for Cancer and Allied Diseases, New York City; and Dr. Walton W. Van Winkle, former Secretary of the Committee on Research of the Council on Pharmacy and Chemistry of the American Medical Association.

THE ARIZONA MEDICAL ASSOCIATION, INC. ARMED FORCES SERVICE ROLL

The following members of this Association have entered Military Service to July 1, 1951:

KINGMAN

BARNES, Broda O., M.D.

MESA

KRIPKE, Morton J., M.D.

MORENCI

SABA, Phillip Z., M.D.

PHOENIX

BAILEY, PERRY W., M.D.

CLAYPOOL, Lewis B., M.D.

FURTH, William G., M.D.

LONG, David R., M.D.

O'CONNER, Jeffrey A., M.D.

STEFFANS, Henry J. J., Jr., M.D.

SAFFORD

KELLER, Robert S., M.D.

TEMPE

GUTEKUNST, R. A., M.D.

TUCSON

DAVIS, James W., M.D.

HELDOBLER, Alfred O., M.D.

OVERMAN, William E., M.D.

RIGGALL, Jack L., M.D.

WICKENBURG

SHANNON, Frederick A., M.D.

WILLIAMS

LAWSHE, Roger D., M.D.

YUMA

LAYLAND, Calvin H., M.D.

STRATTON, Robert A., M.D.

BLUE SHIELD

Dr. Carlos C. Craig, Phoenix, was re-elected president of Arizona Blue Shield Medical Plan for a second term at the annual Board of Directors meeting held April 29, at the Pioneer Hotel, Tucson.

Other officers re-elected at the Board meeting were: Dr. E. A. Born, Prescott, Vice-President and Mr. Earl Barrows, Phoenix, Treasurer. Dr. David C. James, Phoenix, was elected Secretary.

Newly elected to the Board of Directors at the same meeting were: Dr. James and Dr. Zeph Campbell of Phoenix, and Dr. Robert Hastings, Tucson. Re-elected were Barrows and John Durkin of Tucson. Continuing on the Board are: Reverend George Ferguson, Tucson; Dr. Walter Brazie, Kingman; Dr. Royal Rudolph, Tucson; Dr. Craig; A. W. Liddell, Bisbee; Dr. Robert Cummings, Phoenix; Dr. O. E. Utzinger, Ray; John Babbitt, Flagstaff; and Dr. A. I. Pololsky, Yuma. Dr. Campbell was elected to serve on the Executive Committee along with the four officers for the coming year.

Dr. Kenneth B. Brilhart, Cottonwood, and Dr. L. Clark McVay, Phoenix, were elected to the Professional Committee. Others serving on the Committee are Dr. H. D. Ketcherside and

Dr. J. M. Greer, Phoenix, and Dr. Edward Hayden, Tucson.

As a means of informing the public in general and Blue Shield subscribers in particular of the financial stability, the soundness of investment and the amount of services rendered Arizona Blue Shield members by Participating Physicians during the past year, the illustrated message on the foregoing page was published in various newspapers throughout the state.

BOOK REVIEWS

Handbook of Pediatric Medical Emergencies. By Adolph G. DeSanctis, M.D., Professor of Pediatrics and Chairman of the Department of Pediatrics, Post-Graduate Medical School, New York University—Bellevue Medical Center; Director of Pediatrics, University Hospital, New York University—Bellevue Medical Center; Director of Pediatrics, Gouverneur Hospital, New York City, and Charles Varga, M.D., Instructor in Pediatrics, Post-Graduate Medical School, New York University—Bellevue Medical Center; Assistant Attending Pediatrician, University Hospital, New York University—Bellevue Medical Center; Assistant Visiting Pediatrician, Gouverneur Hospital, New York City. Price \$5.00. Pp. 284, with 51 illustrations. C. V. Mosby Company, 3207 Washington Boulevard, St. Louis 3, Missouri, 1951.

It is quite obvious when looking through this book that it is designed for the medical student, the interne and the resident in pediatrics. Any medical student or interne particularly during his pediatric service, would be very happy, I think, to have such a volume as this. It is small in size making it easy to carry and covers the subject for which it was intended rather completely. The various medical emergencies encountered in pediatric practice are arranged for easy reference and the information is given in abbreviated and tabular form in most cases. The typographical arrangement is excellent for this type of reference, the various emergencies being titled in large, bold, capital type with the pertinent information arranged in outline form below it. This makes it very easy to find any particular subject quickly which is important in the practical use of this type book.

The various pediatric diagnostic and therapeutic procedures are excellently illustrated and should be very valuable to the physician who wishes to refresh his memory or some infre-

quently used procedure as well as for the teaching of new procedures to the interne and resident.

One useful feature is the large list of ordinary household cleaners, insect killers and other household chemicals with information as to the poisons which they contain and a rather complete outline of treatments for these various poisons.

Since any physician, whether he does pediatrics or not has a fairly good chance of being called at some time to act in a pediatric emergency, it would seem that this book would be a practical addition to the physician's library.

The Science of Health, second edition, by Florence L. Meredith, B.Sc., M.D., Fellow of the American Medical, American Public Health and American Psychiatric Associations. \$3.75; 48 Tables and Charts; 134 illustrations; 452 pages, January 3, 1951. The Blakiston Company, 1012 Walnut Street, Philadelphia 5, Pennsylvania.

This book according to the preface by the author is intended for use as a textbook in hygiene courses and would seem to fulfill that function quite well. It presents a good over-all view of the health situation as it applies to the nation and to the individual without entering into tedious detail on any particular item. The book is divided into five main parts, the first being the Introduction and dealing with the national health situation and a general view of the structure of the body. Part two is entitled Daily Maintenance of Health and has to do chiefly with personal hygiene. Part three is entitled Major Health Problems in the United States and deals with the public health situation. Part four is entitled Mental Health and deals not only with the physical care of the nervous system but also with the mental and personality portion of health. There is a chapter entitled the sex impulse. Part five is entitled The Next Generation and has to do with reproduction and with heredity and parental care. A good bibliography is included which should be an excellent guide for further and more detailed study and the index is quite satisfactory.



PERSONAL NOTES

The following Phoenix doctors attended the American Medical Association Annual Convention in Atlantic City, New Jersey, June 1951: *Dr's. Joseph Bank, DeWitt W. Englund, George S. Enfield, Robert S. Flinn, Jesse D. Hamer, Wallace Meyer, and M. James Whitelaw.*

At the May 28th meeting of the hospital Staff at Good Samaritan Hospital, a program was presented by the hospital house staff. *Dr. James Shoun* spoke on "Diagnostic Pitfalls in Lupus Erythematosus." *Dr. Lloyd A. Owens* reported "Two Cases of Untoward Reactions Following use of Intravenous "B" Complex," and *Dr. C. Thomas Disney* presented "An Evaluation of Internship at Good Samaritan Hospital."

At the June Maricopa County Medical Society Meeting held June 4, 1951, at the Good Samaritan, a new constitution and by-laws of the Society was adopted, and a loan plan for doctors with hardship going into military service from the County Society. *Dr's. Oscar W. Thoeny and Archie Cruthirds*, Phoenix, gave reports of the County and State Hearing Conservation Committee.

Mr. Frederick G. Mitten, formerly of New York City has been chosen executive-secretary of the Maricopa County Medical Society, and was introduced formally to the membership at the June meeting. He has visited the Santa Clara and Alameda medical societies to survey their programs in behalf of improving medical public services.

Dr. David James, Phoenix, gave a Review of Gall Bladder Surgery for 1950 at the June 11th St. Joseph Hospital Staff meeting. This excellent review was discussed by *Drs. Karl Harris and J. H. Patterson*, Phoenix.

The Memorial Hospital, Phoenix, Arizona June staff meeting was held June 18, 1951. Following "Review of Autopsies" by *Dr. Maurice Rosenthal*, Phoenix, "An Unusual Kidney Stone Case" was presented by *Dr. Paul L. Singer*, Phoenix. *Dr. Otto Bendheim*, Phoenix then reported "Some Clinical Experiences with "Anti-Abuse."

Dr. John R. Green, presented "The Surgical

Therapy of Focal Epilepsy" with a film at the June 25th Good Samaritan Staff meeting.

Dr. Edith Lord, Phoenix, Director of the Mental Health Division State Department of Health, attended the Western Psychological Association meeting at San Jose, California, where she presented "Personality Changes with Hanson's (leprosy) as Measured by the Ronschaeh Ink Blot Test."

The following doctors attended the April meeting of the American College of Physicians in St. Louis April 1951: *Dr's. Joseph C. Ehrlich, Leslie R. Kober, Kent H. Thayer, and O. O. Williams*, Phoenix. *Dr. Lipschultz* of the Phoenix Veterans Administration attended this meeting, as did *Dr. Walser* of Whipple, Arizona. Some Tucson physicians attended this meeting, but the editor does not know of their identity.

Dr. R. Lee Foster, Phoenix, has taken over direction of what was formerly the Pathological Laboratory in the Professional Bldg., Phoenix, and is operating it as "Professional X-ray and Clinical Laboratory" with *Drs. J. W. Kennedy, and W. W. Watkins*, Phoenix, as associates and consultants.

An Arizona Chapter of the Fellows of the American College of Surgeons, has been organized. Officers were elected as follows: *Dr. Meade Clyne*, Tucson, President; *Dr. Norman Ross*, Phoenix, Vice-President; *Dr. Clyde E. Flood*, Tucson, Secretary-Treasurer. Councilors are: *Dr. Joseph M. Greer*, Phoenix, *Dr. Clarence H. Tucson.*

Kuhlman, Tucson, and Dr. Royal W. Rudolph,

Dr. George S. Enfield, Phoenix, has been elected a Fellow of the American College of Anesthesiologists."

Dr. Marcy L. Sussman, Phoenix, has been elected to membership in the New York Academy of Sciences.

Dr. William Snyder, Phoenix, has been appointed by *Dr. Donald Pillsbury* to the University of Pennsylvania Service at the Skin and Cancer Hospital of Philadelphia. He begins this residency July 1, 1951 upon completing his second year as resident in Dermatology at the Cincinnati General Hospital.

SECRETARY LULL'S LETTER

May 14, 1951

That medical science has no boundaries certainly is exemplified in the recent travels of our President, Dr. Elmer L. Henderson. In serving the Association, during the past year Dr. Henderson has traveled approximately 100,000 miles.

A few weeks ago he was flying over enemy lines in Korea. Last week found him in Geneva, Switzerland, at the council meeting of the World Medical Association, of which he is president. He was accompanied on this last assignment by Dr. Louis H. Bauer of Hempstead, N. Y., Secretary General of the W.M.A. and Chairman of the A.M.A. Board of Trustees, and Dr. R. L. Sensenich of South Bend, Ind., a member of the council and Past President of the A.M.A. Following the council meeting, Drs. Henderson and Sensenich accompanied an Air Force mission to Germany and France.

The best way I know of reporting to you on what transpired is to let you read part of a letter just received from Dr. Henderson:

"Our trip by air was uneventful except for an unexpected stop at Goose Bay, Labrador, a military installation of the Royal Canadian Air Force. While awaiting the refueling of the plane we chatted with Dr. Joseph Carroll, flight lieutenant for the Canadian Air Force. He said the biggest health problem in that remote spot, where the temperature drops to 33 below in winter and climbs to 100 in summer, is tuberculosis in Eskimos. Every day, they come trekking into his small post hospital. Most of the cases are in advanced stages.

A polio outbreak a year ago brought more than 30 natives to the hospital in less than two weeks. The cases were transferred to Halifax for treatment.

"We arrived in Geneva via Paris and found the meeting of the Council of the World Medical Association stimulating and worth-while. By authority of the General Assembly, granted at the New York meeting last October, the council elected the Japan Medical Association and the Western German Medical Association to membership in the W.M.A. Japan has 55,000 doctor members and Western Germany has 60,000.

"It was made clear that both of these organizations had denounced war crimes and would abide by principles contained in the Declaration of Geneva.

"With Japan and Western Germany, the World Medical Association now comprises 42 national medical associations with a combined membership of well over 500,000 physicians. New membership applications have been received from several other countries, including Latin American and Asian.

"One day of the council meeting was devoted entirely to a discussion of finances. Several council members, including President-Elect Dag Knutson of Sweden and Dr. Otto Rasmussen of Denmark, expressed appreciation for the financial help extended by the American Medical Association to the World Medical Association.

"We owe the doctors of America a great debt of gratitude for the help they have extended since the association's founding in 1947," Dr. Knutson said.

"After the council adopted a resolution expressing its appreciation of the financial help extended by the United States Committee and the A.M.A., a committee was appointed to study and make recommendations as to the financial affairs of the organization. The four committee members are: Treasurer Otto Leuch, Switzerland; Dr. Rasmussen of Denmark; Dr. J. A. Pridham of England and Dr. L. Garcia Tornel of Spain.

"Dr. Bauer and I were pleased that the European countries are particularly anxious to assume a greater proportion of the financial burden. One of the biggest drawbacks, however, is that under present financial restrictions it is impossible to get money out of some of the countries. The newly-appointed committee will work on this phase of the problem, with the hope of finding a solution.

"The council members were guests at a reception tendered by the International Committee of the Red Cross, whose headquarters are in Geneva. Located in a neutral country, the International Red Cross is particularly qualified to act on humanitarian matters during wars. In World War II it opened a central prisoners of war agency in Geneva and by the end of 1946 its card index for prisoners of war and civilian internees contained some 39,000,000 names. The staff comprises about 4,000 persons, including 1,000 volunteer workers.

"On another evening, we were dinner guests of the Geneva Medical Association at an age-old inn nestled in a forest near the snow-capped Alps. There were many speeches, excellent

food and sincere exchanges of friendship. I stressed the importance of these World Medical Association meetings in furthering the cause of medicine throughout the various countries.

"The trip has been most enjoyable, although a bit tiring at times. We have been tendered gracious hospitality."

"*Today's Health*" voted public interest award. Dr. W. W. Bauer, editor of *Today's Health*, was informed by the National Safety Council recently that the A.M.A. publication was one of six magazines in the general publications field to receive the council's Public Interest Award for 1950.

Mr. Ned H. Dearborn, president of the National Safety Council, in his letter to Dr. Bauer, said in part: "We are proud to confer this public recognition for exceptional service to safety, and are extremely grateful to you. There is no doubt your efforts have helped to prevent many accidents and saved lives."

I've just completed reading an article by Paul de Kruif in the June issue of *Reader's Digest*. It knocks into the proverbial "cocked hat" the piece entitled "Our Alarming Doctor Shortage," which recently appeared in another national magazine.

In fact, the de Kruif article is so good—and it should carry a great deal of weight because of the international reputation of the author—that the American Medical Association has taken steps to see that it gets into the hands of every doctor in the United States.

And, with the help of the medical profession, the article can come to the attention of millions of people aside from the 6,000,000 who are subscribers to the *Reader's Digest*.

Consequently, the A.M.A. has obtained reprints of the article. A copy will be sent to every doctor, advising him that additional reprints for his waiting room may be obtained through the state medical society. County society secretaries will be able to obtain their supplies through the same sources. We should make every effort to place a copy of this article in the hands of every molder of public opinion.

DeVoto Article Also Receives An Answer. *Harper's* magazine recently carried an open letter by Bernard DeVoto to his doctor. DeVoto

said he was deducting 25 cents from his check in payment of his doctor's bill because he did not believe in contributing indirectly toward the \$25 which the doctor had sent to the A.M.A. The letter was hailed by socialized medicine proponents as presenting an excellent idea.

The Freeman, in its April 23 issue, likewise thought the plan was a good one and should be applied to other bills. For instance, the magazine suggested, it could be applied to our income tax bill. If we don't believe the R.F.C. should lend its money for certain purposes, or that government funds should be used to raise our food costs or to pay some bureaucrats salaries, well, just make deductions from our tax payments. The only drawback, as the *Freeman* pointed out, is that the government could put us in jail.

Nevertheless, the article serves to show just how ridiculous some proponents of socialized medicine can get.

This Year's Clinical Session Moved to Los Angeles. Due to conflicting meetings, the unavailability of the Coliseum and other considerations, the 1951 Clinical Session will be held in Los Angeles instead of in Houston, as planned originally. The action was taken upon the recommendation of the Local Medical Committee on Arrangements and the Texas State Medical Association. Los Angeles was selected by unanimous vote of the Board of Trustees. The dates will remain unchanged—December 4 to 7, inclusive. The scientific exhibits will be in the Shrine Convention Hall.

FOR SALE

X-ray machine used less than 6 months, Westinghouse 100kc.—100 M.A., Bucky, Vertical and horizontal fluoroscopy. All accessories included such as large developing tank, 3 cassettes, lead apron and gloves, viewing box etc., all new. Purchase price \$3,500. Ask \$1,995 F.O.B. Northern Texas. Reason for selling, ill health. Address in care of

ARIZONA MEDICINE JOURNAL
426 Heard Building
Phoenix, Arizona

WOMAN'S AUXILIARY



MRS. ROYAL W. RUDOLPH

INAUGURAL ADDRESS

During the past year, each day has brought to me, as your president-elect, a stronger realization of the tremendous responsibility ahead. I could not help feeling inadequate for the honored position which you, today, have bestowed upon me. But knowing the confidence which has been shown in electing me, I have tried very hard to equip myself and now pledge that I will carry on as president of the Woman's Auxiliary to the Arizona Medical Association to the best of my ability. I wish to pay tribute to Mrs. Herzberg for her splendid leadership this past year and sincerely thank her for the time and energy she has spent to give me a better understanding of auxiliary work. I am grateful to the new officers and committee chairmen who have accepted their posts and pledged their support for the coming year. We are privileged to have with us today our National President, Mrs. Herold, whose message, as always, will be a great inspiration to us all.

America is the country it is today because there has been freedom of opportunity. People wanted freedom; they worked, sacrificed and fought for it. Then came the tendency to take

the American Way of Life for granted. Rather than lose it by carelessness and indifference, we have been awakening to the fact that our freedom is endangered. We must work harder and sacrifice more to keep this heritage. The responsibility is not for a few; every American woman can do her part through some chosen channel. We as doctors' wives are privileged to extend the aims of the medical profession to all organizations which look to the advancement of health and health education.

What can we do as individuals? Our first step is self-education. Reading *Medical Journals*, our *Bulletin*, *Arizona Medicine* and *Today's Health* will familiarize us with the background and current happenings in medicine. County programs aim to give members a better understanding of all local problems, and to include a briefing of both state legislation and national legislation incorporated in the Capitol Hill reports from Washington. It is hoped that from time to time we may pass on to our membership a summary of information received from the National Educational Campaign in order that our members can keep abreast with the progress being made by the A.M.A. in its fight against socialized medicine. Members-at-large and members of component auxiliaries can keep well informed through their own organization by reading and by attending meetings.

By accomplishing this first step of self-education, we are preparing for the second because infiltration of informed people is the key to successful public relations. The county reports read this morning show that Arizona's Medical Auxiliary has had an active public relations program, much of which will be continued next year. One of the most important parts of this has been the Student Nurses' Loan Fund. If the war continues, the shortage of nurses may become acute and our program stepped up. The field of Civil Defense confronts us especially as doctors' wives. Throughout the country many of our members who are nurses are offering their services as teachers; all members are urged to join classes so should an emergency arise, we shall be prepared to aid our husbands in their community responsibilities.

With the approval of the Doctors' Advisory Council, the Public Relations and Health Committees hope to combine efforts in sponsoring a Health Education Program in Arizona through the media of radio and film. Each component

auxiliary will vary the program according to its special community needs. I am sure that members-at-large also will see ways in which their communities can benefit from this project and I hope they will not hesitate to approach the state chairmen for helpful information. Though this Health Education Program may have to start on a modest scale the first year, it holds tremendous possibilities for the future.

In conclusion, may I ask if you, this day, will pledge yourself to do the following things this coming year?

1. Become a member of the auxiliary by paying your dues.
2. Subscribe to and read the *Bulletin* and *Today's Health*.
3. Read *Arizona Medicine* when it comes to you each month.
4. Attend your county and state meetings. Will you evaluate the work that can be accomplished with collective effort by the Medical Auxiliary in the rural areas, in the communities and in the state? If you believe in its value, will you set aside part of your time to aid our auxiliary in its effort to be of service? No country can be stronger than its states. No state can be stronger than its communities. No community can be stronger than its members. And, likewise, this is true in our organization; our auxiliary will be as strong as you and I make it. True, it takes reliance, resourcefulness, initiative and courage but with it all, will come the joy and inner satisfaction of worthwhile accomplishment.

Mrs. Royal W. Rudolph
State President

SUMMARY OF BILLS BEFORE CONGRESS ON FEDERAL AID TO MEDICAL EDUCATION

There are seven bills in Congress which would provide federal subsidies for medical schools. One is in the Senate (S.337) and the others are in the House of Representatives. The common denominator, or theme, in all is a presumption that there is a shortage of physicians which can only be overcome by subsidizing medical schools with federal funds. To accomplish the objective, several approaches are outlined in these bills.

S-337 goes beyond the common theme by stressing the defense needs of the nation. Its method

of approach is through aid to medical, dental, nursing, public health, osteopathy, and allied technical schools. This bill had bipartisan support in the Senate Committee on Labor and Public Welfare and was reported out by unanimous consent of its members. Objection has been raised repeatedly when it has been called up on the Unanimous Consent Calendar. Technically it may be considered at any time. Two of the House bills, H.R. 1781 and H.R. 2707, are identical with S. 337.

Another approach—through grants for construction only—is contained in H.R. 2152 which also adds to the common theme by stressing national defense and security.

A quite different approach to the common objective is contained in H.R. 3371, which would in effect turn the whole program over to the National Science Foundation. The Foundation would be authorized to work up a 5-year program for federal aid to medical schools, to students, and to faculties. The program and administration would be left entirely to the Foundation after approval by Congress.

A variation on the theme is the proposal of H.R. 3511, which would create a corporation within the Federal Security Agency called the "Medical College of the United States". Graduates would be compelled to serve in either the military or some federal service for a stated period—failing to do so they would be obligated to reimburse the government a part of the cost of their education.

Another bill creating a new medical school for producing physicians for governmental service is H.R. 3931. This school would be called the "United States Medical Academy". On completion of training, each student would be commissioned and required to serve five years in the military or some other federal service.

The American Medical Association opposes the passage of all these bills. Any program of grants in aid to medical education has far reaching implications with respect to the freedom of the medical schools. Financing of medical schools when not undertaken by private organizations should be a responsibility of the state. The establishment of a Medical Academy or Medical College of the United States, would not overcome the shortage of physicians, presuming there is such a shortage.

It is quite apparent that the features of these bills will be extensively discussed, especially

S. 337, and you can be of material help to your legislators by sending him the following:

1. Your reasons for opposing the bill.
2. Such documents as you may have in support of the position you have taken.
3. Your knowledge as to whether there is, or has been, a shortage of physicians in your area.
4. In your opinion, if the medical school in your state (if we had one) were in need of financial assistance, should the aid be given through federal subsidies or increased state appropriations.

PROPOSED PUBLIC RELATIONS AND HEALTH PROGRAM FOR 1951-1952

It is our great hope to inaugurate, in Arizona, a program of Health Education patterned from the "Healthy Living in our County" project developed by the State University of Texas, with the cooperation of 23 organizations and agencies interested in the promotion of a constructive health education program, based on radio broadcasts, but using movies and posters as well.

After two years of successful experience, they now have complete material for the organization and execution of this program, available to any state interested in adapting this project to its own use. The major expense in promoting this plan would be the printing and distribution of the materials.

Briefly, the plan is as follows: All programs revolve around a quiz session in which teams of fourth, fifth, and sixth grade children from two schools compete in an attempt to answer the most questions asked by a master of ceremonies about a given health subject. A visiting expert in the health field under discussion acts as judge in case of dispute. Classes in the competing schools, those in other participating schools, and many parents listen regularly to the broadcasts, and preparatory and follow-up sessions under the supervision of teachers adapt each health subject to the local situation.

Acceptance of the "Healthy Living" program has been universal. School children have fun taking part in and listening to the shows. Teachers find health an easier subject to get across to their charges. Parents appreciate the better health habits of their sons and daughters and privately are proud of their own increased knowledge. School, home and community facilities reflect wiser health attitudes. It is im-

possible here to go into detail about the scripts for "Healthy Living in Our County", the procedures to be followed, (in arranging with schools and radio stations for its production), and the specific results which accrue from the program.

"Healthy Living in Our County" is a positive approach to health education, providing factual information for youngsters in a form pleasing to them and creating a community interest in health which consistently results in better habits and better facilities. Arizona State Medical Auxiliary would search a long time for a better project to support, for in encouraging this program, physicians' wives (and physicians, too) can demonstrate their desire to enhance health standards and performance within their communities.

Necessary Steps to be Followed in Order to Inaugurate "Healthy Living In Our County" Program

1. Someone (preferably a doctor) to present program to University of Arizona to enlist its sponsorship.
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The nutrient contribution of three servings of Ovaltine in milk is defined in the appended table.

1. Jeans, P. C.: Feeding of Healthy Infants and Children, J.A.M.A. 142:806 (Mar. 18) 1950.

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